Textile World

VOL. 85, NO. 10—ESTABLISHED 1868

CONTENTS SEPTEMBER, 1935

DOUGLAS G. WOOLF
Editor

William B. Dall.....*Managing Editor*
Edwin D. Fowle.....*Associate Editor*
Winn W. Chase.....*Assistant Editor*
John Black .....*Assistant Editor*
James A. Austin...*New England Editor*
William G. Ashmore...*Southern Editor*
Paul Wooton. *Washington Correspondent*

A. P. GUMAER .....*Manager*

MANAGEMENT
Prophecy on Page 1 (*Editorial*) 77
The Editor Says 78
Behind the Scenes, This Month and Next..... 79
Better Business Dwarfs Other Textile News 80
Washington Letter 81
Says "No" on two Counts; "Yes" on Things That Don't Count 82
Does the Wool Industry Face a Migration South? 86
New Rayon Record in U. S. and World Output This Year..... 93

MERCHANDISING
Delivery Dates—Avoiding Conflict with Selling Office..... 84
Increasing Efficiency of Rayon's Merchandising Effort..... 96
Institute Initiates Plans to Improve Carpet Position..... 120

MATERIALS
Rayon Pulp from Southern Pine..... 98
Rayon Staple Must Stand on Own Merits in U. S..... 107

MILL ENGINEERING
Colored Oil Places Responsibility for Oil Stains..... 92
True By-Product Power—What It Is..... 119
New Machinery and Processes..... 128

MEN
A "Strike" Without a Strike..... 88
Logic—A Drama in One Act..... 88

METHODS
Avoiding Knots and Loose Ends in Seersuckers..... 89
Worsted Mills Simplify Drawing Process..... 90
What Staple of Cotton to Afford Good-Running Yarn?..... 91
Technical Developments in Rayon Manufacture..... 94
Crepes and Crepage—A Five-Part Symposium..... 99
Promising Polo Shirt Constructions for 1936..... 106
Rayon Tests and Specifications Progress Rapidly..... 108
For Spring—Shantungs, Cloqués, and Other Exotic Fabrics.... 109
One Mill Learned Value of pH Control..... 117
Pad Dyeing Faults—Preventing Spots, Creases, etc..... 118
To Apply Hosiery Transfers Efficiently..... 120
Keeping Records of Experimental Fabrics..... 121

ELEVENTH ANNUAL
RAYON YEARBOOK NUMBER
Rayon Features, pages 93-112
Index on page 137

DEPARTMENTS

The Overseers' Corner 122
Questions and Answers 124
Personal Page 126
New Machinery and Processes 128
New Publications and Business News 130
TEXTILE WORLD Analyst 131
Quotations 146

INDUSTRY BRANCHES

Cotton Digest 132
Wool Digest 134
Rayon Digest 136
Silk Digest 138
Knitting Digest 140
Processing Digest 142
Engineering Digest 144

McGRAW-HILL PUBLISHING CO., INC.
Bragdon, Lord & Nagle Division, 330 West 42d St., New York

Bragdon, Lord & Nagle Division
Henry G. Lord.....*President*
Frank L. Nagle.....*Chairman*
James H. McGraw, Jr.....*Treasurer*

McGraw-Hill Publishing Co., Inc.
James H. McGraw.....*Chairman of Board*
Malcolm Muir .....*President*
J. H. McGraw, Jr.....*Exec. Vice-Pres.*
Henry G. Lord.....*Vice-President*
Borden R. Putnam.....*Treasurer*
Donald C. McGraw.....*Secretary*

Branch Offices:
Washington.....*National Press Building*
Boston.....*1427 Statler Bldg.*
Philadelphia.....*16 South Broad St.*
Greenville, S. C.....*1303 Woodside Bldg.*
Chicago.....*520 N. Michigan Ave.*
Cleveland.....*501 Guardian Bldg.*
St. Louis.....*555 Paul Brown Building*
Detroit.....*2-257 General Motors Bldg.*
San Francisco.....*883 Mission St.*
London, England...*Aldwych House, W.C. 2*

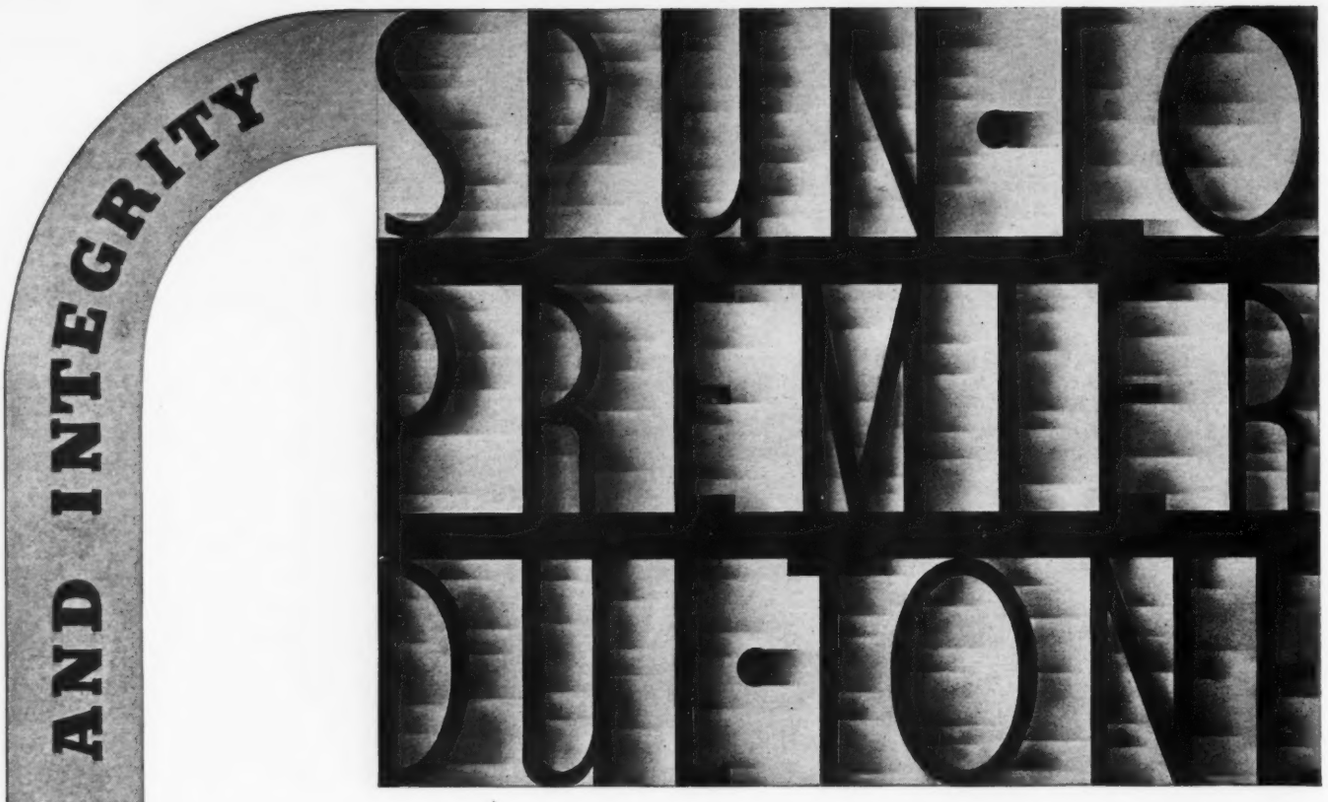
Copyright, 1935, by McGraw-Hill Publishing Co., Inc.

TEXTILE WORLD

(Formerly *Textile World Journal*) with which are combined *Textiles*, *Posselt's Textile Journal* and *Textile Advance News*. Published monthly. United States and Possessions, $3 per year; Canada (including Canadian duty), $3.50; all other countries, $5, U. S. currency or 20 shillings. Single copy, 35 cents, excepting special issues.

Of this issue 10,800 copies were printed.

Member of Audit Bureau of Circulations
Member of Associated Business Papers, Inc.



These trade names identify the dependable yarns and knitted fabrics produced by Industrial Rayon Corporation. And they also stand for the sincerity and whole-hearted cooperation that go into all of INDUSTRIAL'S business dealings. ◆ ◆ SPUN-LO, PREMIER and DUL-TONE are worthy products backed by an intelligent program of Sales, Service and Trade Promotion which smooths the way of finished commodities straight through to the consumer.

INDUSTRIAL RAYON CORPORATION
9801 WALFORD AVENUE CLEVELAND, OHIO

Textile World

September, 1935

Editor: DOUGLAS G. WOOLF

PROPHECY ON PAGE 1

THE modest little "prophecy" we made in the course of an article in last month's issue can now be promoted to Page 1.

At that time we said: "Textiles are on the verge of an upward move. It looks like a good fall, in both activity and prices. We have a hunch that, by the time our next issue appears, this view will have become generally accepted. In fact, this is more than a hunch; all signs point that way. So hold on tight!"

We are still more confident this month.

■

There has been a succession of developments recently each of which has tended to restore confidence to the textile industry. The first and most important one—affecting all branches of the industry—was the remarkable way in which manufacturers held the line after the Supreme Court's NRA decision. This one development, alone, raised the morale and assurance immeasurably.

Then uncertainties affecting the cotton division were removed or lessened in rapid succession. (And the cotton branch is not only the biggest branch of textile manufacture, but it serves as a sort of barometer. When cotton is sick, the other divisions seem to acquire a sympathetic headache.)

The market chaos attending the Hoosac case decision was straightened out. The cabinet committee made its report and retired from the scene. The cotton loan problem was compromised in what we consider a very brilliant manner.

And Congress went home!

But the action which reflected and consolidated all these gains was the price advance. Twice in August a general advance was made in cotton goods—and each at a time when such psychology was needed to stiffen the attitude of sellers, and sound a warning to buyers. Incidentally, it is interesting to note that George Sloan is continuing his public service even though in a private capacity. It was his company that took the lead in both these constructive steps. The prompt support given by other firms was a most heartening demonstration.

Psychology, however, is not the only ingredient in the present outlook. There is a large potential dose of our good old friend demand. Business has improved throughout the country; retail sales of textiles have been good; mill operations have continued under restraint.

The result, in our opinion, means good business ahead for the first-hand textile markets. Seldom have we been more confident of this fact than we are at present. And—far more important—we believe buyers are aware of it too.

■

Just how long better times will stay will depend, to a considerable extent, upon the actions of textile manufacturers themselves. If they go off on a production joy-ride as demand increases, or if they become panicky on prices during one of the inevitable periods of slackening, then we'll just go back to one of the old merry(?)-go-rounds where nobody makes any money.

But somehow or other we feel that the industry has learned its lesson and that it is now in a mood to insist upon a decent return for itself and its workers.

The Editor Says:

THE main trouble with the cabinet committee's cotton textile report was that it should never have been written.

That is said in all kindliness—or at least in as much kindliness as is germane to the occasion. Actually, we think the committee did almost as well as it could, with an impossible job.

Why impossible?

Well, there were just three main issues: (1) Processing tax; (2) Japanese imports; (3) North-South wage differentials. On No. 1, no one in full possession of his senses could have expected a Government committee to repudiate one of the most important parts of the Administration's program. . . . . Not while Secretary Wallace was on the committee, at any rate.

On No. 2—Japanese competition—while the Department of State is having its hallucinations about "voluntary and friendly" agreements with Japan, nothing of a constructive nature can be expected.

The last of the problems—sectional wage differentials—was shelved by the Supreme Court's NRA decision. We imagine the cabinet committee was glad to drop that particular piece of dynamite.

So, after all, the report was just about what might have been expected under the circumstances.

■

Better Never Than Late

THE pity, as we indicated above, is that the report was written at all. It is a futile piece of business—and futility always makes people angry.

In the first place, it was months late. The time for its appearance was in the middle of the industry's travail, when things seemed blackest and outside help most urgent. There was no excuse for the delay—at least, none that we can consider valid.

In addition to being late, the report was provoking because of its general tenor. It contained a great deal of gratuitous advice and comment—some sound, some otherwise—which merely restated, or in cases mis-stated, the industry's various problems which have been analyzed long before the committee undertook it—and much better.

The industry did not ask for that. It asked for help in certain specific directions. Finding itself unable to grant that help, the committee should have said: "Sorry, can't do anything for you today"—and let it go at that. . . . . But, even as we write this, we realize we are expecting too much of human nature.

P. S. Elsewhere in this issue (page 82) is our detailed comment on the several recommendations made by the committee.

P. P. S. Gorman lost no time appropriating the committee's report as U. T. W. property. Sort of reminded him of his Ellenbogen bill.

■

The Cotton Loan

"NO sensible person—regardless of his opinion of AAA economics—would expect the Government to step out of the cotton picture abruptly. It just can't be done. But any sensible person will expect the Government to make plans for gradually easing out of an untenable position—and to take agriculture and industry into its confidence as those plans increase."

That was our comment, in these columns, immediately after the break in cotton last March.

The replacement of the 12c. loan by a 10c. loan plus a subsidy up to 2c. represents the first move of the Government to "gradually ease out." And we, for one, are delighted.

Naturally, anyone with inventory to protect would have rooted for a continuance of the 12c. loan. But once it was decided, we are confident that most manufacturers heaved a sigh of relief.

So far as the gift feature is concerned, that doesn't bother us a bit. It's better to give a piece of the United States Treasury to the farmers than to try to keep the market up on stilts.

The move means, more or less, a return to a free market in cotton. The 9c. loan, initially proposed, would have assured this more effectively—but we were lucky to get the 10c. compromise in those wild hours before Congress went home.

Those who have been fighting against the ruination of our export market in raw cotton have won a victory. We hope it is not too late.

Incidentally it was rather amusing to read, right after the adoption of the 10c. compromise, that "AAA officials were still convinced that by keeping the domestic market, through the loan figure, below the world market, a stimulation of exports would result." AAA officials had concealed their anxiety on this score rather successfully up to that time.

■

A City in Shadow

WASHINGTON is a discouraging place nowadays. There is an air of indecision and almost hopelessness among the people in the different departments. This is natural of course. The NRA decision, and the strong possibility of an adverse AAA decision this fall, mean that nobody knows whether the things he is doing are to stand up—or even how long he will have a job.

We attended one of the closing sessions of Congress and got even a more discouraging reaction. Law-making is never too scientific, at its best. At its worst—and we think we saw it at its worst—it is a cross between roulette and seven-card stud with deuces wild.

We hope that the breathing-spell between now and the re-convening of Congress will permit the Adminstration to re-shape its purpose, particularly insofar as adjustment to Supreme Court decisions is concerned. For immediately practical purposes, nothing is to be gained by debating basic changes in law. Whether they are to come later or not, the immediate need is for the Administration to re-form its lines and go ahead as well as it can within the limits set down by the Court.

This is just plain, practical politics, about which we know nothing, however.

■

Or What?

WE have a worry gnawing at our vitals. Business indices are going up; times are getting better; they say the depression is over. *But*, we still have almost as many unemployed, forgetting Federal relief, as at the depth of the depression. Must we count that situation as a chronic one? Or what?

It's something to think about.

BEHIND THE SCENES

This Month

Rayon Triumphant: Rayon sets new records. And TEXTILE WORLD presents its Eleventh Annual Rayon Year Book Number. The special section starts on page 93.

■

Rayon Crepage: One of the principal features of the rayon section is a symposium on crepage starting on page 99. For months textile men have been urging a more complete interchange of information among yarn manufacturers, throwsters, weavers, and finishers on the various factors involved in the production of rayon crepe yarns and fabrics. Our symposium is contributed by authorities who present the views of each of the parties interested and discuss what each can and cannot do to influence the degree and character of crepage in the finished fabric. The problem affects all departments of the mill which handles rayon.

■

No Substitute: In the article about rayon staple on page 107 we are not very encouraging—or discouraging, depending on the point of view—about the likelihood of cotton and wool being replaced for ordinary purposes by spun rayon; but we do point out some inherent characteristics of the new fiber which may give it recognition on its own account.

■

Midsummer Madness: We knew we couldn't keep up the good start we made in July when, quite appropriately for the season, we went to Canada on business. In August, we had to head the other way: toward Washington, of all places. It's not exactly a summer resort. . . . The business at hand was the cabinet committee's report. We analyze it on page 82, and add a few general remarks on page 78.

■

Going South? The antics of the U. T. W. this summer in demanding excessive wage increases in New England, the prolonged strike at the Uxbridge Worsted Co., and the actual establishment of three branch plants in the South by northern interests, have all whipped discussion of a possible migration of the woolen and worsted industry to a fever point. As our contribution we present an impartial survey of the situation, based on investigations in both the northern and southern sections. This appears on page 86.

■

Delivery Dates: You may have heard of occasional conflict between mill and selling office regarding delivery dates. Here is suggested a specific method whereby such conflict can be avoided. (Page 84.)

■

Tale of Two Cities: One is Minneapolis, where the union forced employees of the Strutwear Knitting Co. on "strike," whether they wanted to or not. And they didn't want to. . . . The other is Greenville, where a union official gives some amazing (!) information to our southern editor. . . . These samples of the labor "leadership" in textiles are on page 88.

■

Spinning Capacity: And now another useful chart from Carl D. Brandt—on page 91. Suppose you want to spin 35s cotton yarn. Look at the chart and see what staple length you need to insure satisfactorily running work.

■

Too Many Operations: Worsted drawing is an unnecessarily long-drawn-out process. The number of operations can be reduced with a saving in costs and without sacrifice of yarn quality. Recent American tests have indicated it. Now an Englishman says so on page 90.

■

A Bad Smell: When goods were returned because of a rancid odor, a certain manufacturer of bathing suits began to realize the value of pH control in wet finishing operations. The simple method and equipment which he installed will prove of equal benefit in other plants. (Page 117.)

■

Not Free: Many plant owners and operating engineers have the mistaken idea that the power generated in their own mills is obtained for "next to nothing." H. E. Corl, consulting engineer, corrects this impression in an article on True Byproduct Power—What it is; How it is generated; How to calculate its cost. (Page 119.)

Next Month

Just a few samples:

A Stab in the Dark: That's what the selection of twist for cotton roving too often amounts to. There's no scientific way to calculate it, so it's usually a guess. Next month we offer a chart which shows the right twist for any roving—in a twinkling.

When Warps Are Out: It's a good time to check over the loom and obviate stops when the warps are in. What to look for and how to remember to do it—next month.

Latch-Needle Designs: The calculations are quite similar to those for spring-needle cut-presser designs, and next month J. Frederick Cahill explains how his series of articles on the latter subject can be used to advantage by latch-needle men.

Last Month's Echoes

Editor, TEXTILE WORLD:

As I read through the article giving your impressions gained during your recent trip to Canada, my admiration for your powers of observation and of absorption (mental) steadily increased until I came to that terrible statement near the end of the article in which you unstintingly criticized Canadian mills for their slowness in adopting new machinery and processes. What could my reaction be to a statement which as far as this company at least is concerned is so totally at variance with the facts?

In order that your impressions may be corrected, I may say that there is practically nothing in the way of improvements in cotton manufacturing equipment that has not been installed at our several mills during recent years.

All that I can hope for is that your remarks do not get into the hands of any Canadian politicians whose pet hobby is to bait the Canadian textile industry and advocate tariff reductions.

MANUFACTURER.

(*Editor's Answer:* "It was good to get your frank reaction. However, it does not seem to me that I 'unstintingly' criticized Canadian mills for their slowness in adopting new machinery and processes, as you state in your letter. My comment on that point was: 'Our net conclusion is that, on the average, the physical condition of Canadian mills is not up to that of mills in this country. We believe Canadian manufacturers are slower in adopting new machinery and processes than are manufacturers in the United States. We expect that there is a trend toward greater receptivity in this connection; if so, its importance cannot be over-emphasized.' In other words, instead of an unstinting criticism of your country, I was merely attempting to compare it with this country, insofar as my own observations have permitted.")

■

Editor, TEXTILE WORLD:

I marvel at your ability to so clearly grasp the situation in Canada on so short a trip. It may be that you have a mental divining-rod and if you have any extra ones, you might ship one along to me.

ANOTHER MANUFACTURER.

BETTER BUSINESS

By Douglas G. Woolf

Dwarfs cotton loan, strikes, and cabinet committee as textile news

TEXTILES regained their place in sun of publicity during August. Undoubtedly most spectacular news splash came via cotton loan and Huey Long. However, other events also brought textiles out of the business press and into the dailies. Cabinet committee's report got a pretty good news run. Sporadic labor disturbances seemed to be of no public interest until one tragic flare-up broke into Page 1.

Above are what might be called the "popular" textile issues of the month—the events which even the tabloids had to recognize.

To textile men themselves, however, there has been only one big news story: the beginning of definite improvement in textile business and outlook. Processing taxes, cabinet committees, cotton loans, strikes, and other fireworks fade into relative insignificance when the demand picture starts to take on a rosier hue.

So we start with that first.

Outlook:

There is more than mere sentiment in prediction of markedly improved textile business this fall. There are tangibles in each division of the industry. Witness:

Cotton—Principal cause for cheers here is removal of uncertainties, such as those which featured cotton loan, processing tax clause, cabinet committee report, and final wording of AAA amendments. Besides, cotton loan decision, regarded as first constructive step out of an impossible situation, was also a positive factor in the improvement. Decision by WPA to purchase 150,000,000 yd. of cotton textiles for delivery over six to eight months was another. . . . Price advances on goods came at psychological moment. Obviously, these advances cannot continue to "stick" if a weak raw material market develops, but best judgment is that strength in both quarters will be maintained. Latest helpful factor was bullish crop report issued Sept. 9. Altogether, situation is most encouraging in some time.

Wool—Reception of initial lines, and strength of raw material, are basis for expectation of continued activity in woolens and worsteds for balance of year; this would mean one of best wool years of recent periods.

Silk—Continued advance in raw silk during August was one of news features in textiles. With all the reservations and qualifications which must limit predictions in this temperamental field, it seems likely that silk gains will hold.

Rayon—Price advance in viscose was well received, and market anticipates excellent fall.

Knit Goods—Price advance in full-fashioned, prosperity conditions in outerwear, and satisfactory outlook in underwear, all add up to strength.

Summing up, there is considerably more than merely seasonal improvement in textile situation. In other words, the usual upturn which almost always comes in that much-heralded period, "after Labor Day," is not merely being blown up by optimists into a pseudo boomlet. There is substantial indication of better-than-normal activity this fall.

AAA:

Cotton loan problem took the AAA stage away from the processing tax. The triple play from 12c. to 9c. to 10c. made interesting news. New loan policy was about the first important act of AAA to receive general approval. Manufacturers are pretty well agreed that in the long run it will benefit growers, processors, and the general public.

Final passage of AAA amendments was another of the month's contributions. Just how important a contribution this was seems to be open to debate—and plenty of it. AAA has done best job it could in an attempt to put a bullet-proof vest on the act through which it derives its life and the public's money.

Meanwhile, the processing-tax merry-go-round continues to go round. New suits, restraint orders and other legal gadgets are announced by the dozens daily. Government has filed Hoosac Mills case in the Supreme Court; decision before Christmas is likely. Just how much the decision will decide is one of those pretty little points, discussion of which this correspondent will waive.

Cabinet Report:

"Oh, yeah?" seemed to be average reaction of textile men to report of cabinet committee on cotton textiles, discussed elsewhere in this issue. Consensus seemed to be that it just didn't make much difference anyhow. Some fear was expressed that it might be used—or misused—as ammunition in drive toward textile legislation when Congress re-convenes. However, even that boogeyman didn't arouse much interest. So much can happen between now and January, that it seems silly to worry.

U.T.W. took the report right into camp. Gorman "welcomed" it and MacMahon "gave his approval" to it. There is a rumor that they intend to pair it with their pet Ellenbogen bill, arrange some trick mirrors, and exhibit the ensemble in textile centers as the Dionne quintuplets. . . . This couldn't be confirmed at time of going to press.

Labor:

Most of recent labor disturbances in textile mills have been private fights, without being symptomatic of any industry-wide condition. Unfortunately, bloodshed at Pelzer made that situation public property and gave many members of the reading public—as well as those who can only look at pictures—the impression that "hell had broken loose" in the textile industry again, as one of our friends put it. Actually, it hasn't; in fact, the general situation is unusually quiet.

Developments of the month have included the compromise verdict rendered in the full-fashioned hosiery

For more information, see—

	Page
On OUTLOOK:	
Editorial	77
Analyst	131
On AAA:	
The Editor Says	78
Cotton Digest	132
On CABINET REPORT:	
The Editor Says	78
Summary and Comments	82
On LABOR:	
Pelzer Situation	87
Strutwear Situation	88
"Logic"	88

tangle; and the introduction, into the House, of the so-called Ellenbogen bill (HR 9072) sponsored by the U.T.W. and advertised by them as the National Textile Act. We discussed this "Act" last month.

Post-NRA:

Observance of basic code labor provisions by great majority of textile manufacturers continues. For industry in general, Washington dispatch states "another month of returns shows a surprising tendency to maintain wages and hours at code levels."

Several minor branches of the textile industry are among those which have submitted requests to Federal Trade Commission for help in formulating trade agreements.

Review division of NRA has started wide number of special studies in the various industries covering labor relations, trade practices, and code administration. Results will probably be used as guide for new legislation next session. . . . So if the textile industry is a good boy and eats its spinach, it will probably be treated to another investigation. It seems days since the last one!

Foreign Trade:

Report that "gentleman's agreement" for restriction of textile imports from Japan to the United States had been consummated was denied by State Department. In fact, it was stated that negotiations dealing with imports into this country had not even begun; that conversations to date had dealt only with Philippine situation, and no agreement on that had been reached.

Shifting the scene, Washington officials spike reports of shipments of huge quantities of textile and ginning machinery from this country to Brazil, by citing cold figures. Seems it just isn't so.

Miscellany:

Strikes among those on work relief seem to us to dramatize the sorry state into which so much of our economy has drifted. Quite aside from blame or anything of that sort, the very fact that this could happen is intensely discouraging. It seems so futile: a strike against whom? . . .

To close on a more cheerful note, our Washington office reports that new revenue act takes less money out of pockets of industry than had been anticipated.

WASHINGTON REACTION

By Paul Wooton

Washington Correspondent, TEXTILE WORLD

WHILE the report of the cabinet committee on the conditions and problems of the cotton textile industry has called forth frequent slighting reference, there are many who are convinced that this study will have far-reaching influence. One observer who follows textile matters closely described it as "a fresh but not a new diagnosis." Another asked caustically why it took 75,000 words to deny the few requests submitted at the hearings. To the average person close to the textile picture it is just another report, but there is evidence that this report is being read by the public and by the lawmakers who are not so familiar with the situation. Previous reports have attracted little popular attention. Since legislation is playing and will continue to play an important part in textile affairs, it is regarded as significant that this latest report came at a time when information of that character was being sought eagerly on Capitol Hill and when public interest in the whole subject matter was general.

Technical observers are inclined to smile at the solemn reiteration of bromides like net-weight trading and the development of new uses. Notice is taken of the various arguments which are advanced to show that the Government could not undertake export subsidies when Congress, at that very time, was enacting into law a policy of subsidizing exports and backing it with 30% of all customs receipts. Plans to take full advantage of that phase of the amended act were in preparation before the bill was signed.

Friends of the NRA principle already are making capital of the report. They point out in the report that spindles in place in New England decreased from 18,856,000 in 1921 to 12,167,000 in 1930, while those in the South increased. Even a more striking comparison is cited in the report's references to active spindles. Then attention is called to figures showing that the tendency of the industry to shift to the South was halted by NRA and a more stable situation maintained.

In Administration quarters that phase of the report also is being used to show that factors other than the processing tax are largely responsible for the decline of the New England industry. Particular emphasis is placed upon the decline of 33% in the active spindles in Massachusetts between 1921 and 1931, while active spindles in Rhode Island in 1931 had fallen to 40% of 1921. The fact that the number of cotton textile mills decreased in Massachusetts from 245 in 1923 to 178 in 1929 and that active spindle hours in New England decreased by one-half between 1921 and 1931, are being quoted to show that the exodus was in progress before the New Deal had anything to do with the situation.

Attention also is called by Administration officials to the portion of the report dealing with corrective steps that have been taken in the United Kingdom and in Japan. There is outspoken support for the application of some of those ideas to the American industry, particularly the purchase or leasing of obsolete spindles. Legislation to that end will be discussed during the interim between sessions of Congress.

CABINET COMMITTEE

Says "no" on two counts and "yes" on things that don't count

RECOMMENDATIONS of the cabinet committee on cotton textiles are printed below. Following each recommendation, in italics, is the comment of the editor of this publication.

1. Excess capacity and obsolescence: Finding that excess capacity and obsolescence are serious problems in the cotton textile industry, we recommend such legislation and administrative action as may be necessary and feasible to deal with this problem through one or more of the following methods: (a) Limitations on the hours of machine operations; (b) A leasing system for retiring surplus equipment; (c) The purchase and retirement of the most obsolete units after a probationary period under the leasing system.

Such withdrawal of excess equipment, financed by the industry, should be controlled by adequate regulation in the public interest, having due regard to the importance of gradual but persistent elimination of inefficient units and to the necessity of making adequate provision for displaced workers.

The committee's endorsement of the principle of machine-hour limitation is encouraging to advocates of that method—of which we happen to be one. The report calls it "the simplest of the control methods for over-capacity." "Much can be said for the 80-hour week," it adds. But, the committee points out, "different sections of the industry at different seasons of the year might well have a variable schedule of operations without undue administrative complications." This takes care of the claim advanced by some—and here again we are of that number—that seasonal fabrics cannot be put under the same blanket restrictions as staples. . . . Everybody ought to be happy.

Personally, we believe all attention should be concentrated upon the perfection of a control method such as the above—or of a substitute inventory control procedure—before the industry resorts to such gambles as the leasing system and the retirement of surplus equipment. If some proper control along the former lines can't be worked out, explorations will have to be made into uncharted territory. But it's best first to try the known ground.

2. Imports: Finding from the facts before us that the domestic market has been disturbed by recent imports of cotton textiles from Japan, which, though small in proportion to total national production, have nevertheless shown sudden and unusual increase in certain countable cloths, we recommend that to deal with this special situation steps be taken to control these imports, preferably by means of a voluntary and friendly agreement with Japan on limitations of shipments of cotton products to the American market. We recommend this course among other reasons because section 3(e) of the National Industrial Recovery Act is no longer operative, and because the only available mechanism under the flexible tariff provisions would be broader than the problem sought to be dealt with. Other and similar agreements already concluded with Japan hold out the prospect of a successful application of this method to the problem of cotton textile imports from Japan.

This is just plain bunk. The last sentence is particularly misleading. The other "successful" agreements apply to lead pencils and rag rugs. Taking lead pencils as an example, we are informed that the "voluntary and friendly" agreement in that field was concluded by the State Department without consulting the domestic industry. The latter awoke suddenly to learn that Japan had "consented" to a quota 16 times as large as the total of Japanese pencil imports in 1932 and 12,500 times as large as the total of those imports in 1931. The domestic industry feels definitely that it was "sold down the river." Now it is announced that a textile pact is in the making, and the A. P. story on this development refers to the lead pencil experience. In that case, it is pointed out, the Japanese limited their exports to the approximate value of the American cedar wood they imported for use in manufacturing pencils. But, officials explain (naively), that criterion would not hold in textile limitations, because Japan purchases more American raw cotton than any other country or section of the world, and the value is many times that of its textile exports here or to the Philippines. That comment speaks for itself. . . . Quite the most amazing phase of these negotiations between Japan and the United States, is the fact that in the former country the industry concerned, and its experts, are active parties in the study and preparation of the terms, whereas in this country the State Department merely announces the conclusion of a pact, when, as and if. . . . What do you know about that?

3. Exports: Representatives of the industry have requested that raw cotton now financed by the Government be made available to the producers for the purpose of manufacturing articles for export with an allowance of 7c. per lb. upon exportation of the finished product. This proposal would in effect subsidize cotton textile exports. In view of the possible retaliatory measures which might be taken in foreign countries against such subsidy, this suggestion is not approved.

Attention is called to the fact that discussions are in progress with Japan with a view to regularizing the textile trade of the Philippine Islands whereby an important part of the Philippine market would be retained for American producers.

Furthermore, stabilization of the currencies of the world, a reduction in trade barriers at home and abroad, and attention to the special needs of foreign markets by American producers should lead to a recovery of at least some part of the foreign textile markets which have been lost.

One of those mysteries of life is why the members of this cabinet committee are so horrified at the international discord which they visualize as a result of an export bounty, and yet Section 32 of the AAA amendments, recently passed, provides for just about the same sort of thing. Thirty per cent of the gross receipts from all customs duties is to be applied to encouraging exportation of agricultural commodities

and products thereof—the procedure to include the payment of benefits in connection with such exportation. . . .

So far as the last paragraph of the above recommendation is concerned, that is one of those gratuitous comments which might better have been left unsaid.

4. Government purchases of cotton goods: We recommend that Government agencies using cotton textiles for relief or other purposes endeavor to anticipate their needs as far in advance as possible, place orders for manufacture during periods of slack demand, and provide for extended periods for delivery.

Much obliged.

5. Increasing use of cotton: Finding that the utilization of cotton products has not in recent years been increasing, we recommend, in order to promote the extention of the use of cotton, especially along lines in which such extension is not primarily at the expense of other products, that a committee of representatives of the Departments of Commerce and Agriculture and of the industry be established to promote basic research in the use of cotton textiles, and that the facilities of the Government be made available for such research.

It is perfectly all right to try this again. Study of new and extended uses can never be overdone. . . . Just how the researchers are going to walk the tight-rope created by the phrase "especially along lines in which such extension is not primarily at the expense of other products" is something for them to worry about, not us.

6. Net-weight trading: We recommend a change from the present practice of trading in cotton on a gross weight basis to that of a net weight basis, to promote market economies and to eliminate the present handicaps to the use of cotton for bale covering.

We believe most people in the industry agree with this recommendation. Unfortunately, effecting this change is not as simple as the committee seems to believe. Years of agitation and discussion testify to that. But there is still hope.

7. Cotton loan policy: The cotton loan policy is of concern to the cotton textile industry primarily through its possible stabilizing effect. A substitute for such stabilizing effect might be obtained through the hedging of mill holdings of cotton which would afford considerable protection against inventory losses. We recommend an investigation of the hedging requirements of mills looking toward desirable revisions or additions to the functions of the cotton futures markets. Connected with this is the matter of time, place, and quality of deliveries on futures contracts, to which attention should be given in any such study.

We have read this statement, and the expanded recommendation in the complete report, and still have little idea what the committee was getting at. We wonder if the committee has.

8. Processing tax: During the economic emergency as reflected by existing price disparities, we recommend against the discontinuance of the processing tax, which, after due consideration of the alternatives, we regard as the most practical among the available means for securing to the cotton farmers of the nation a return from cotton equivalent in terms of purchasing power to that which existed in the pre-war period and which has enabled them to increase their purchases of the products of other industries, including the cotton industry, thereby benefiting the workers in these industries.

No comment.

MODERNIZATION

"The essence of rationalization in the cotton textile industry is the utilization of the most efficient equipment and methods in getting cotton from the producer to the consumer at the minimum cost. The possible advantages of a logically developed program looking toward this objective might offer material advantages to the industry . . . Modernization of mills, particularly with respect to the adoption of equipment that will reduce costs, is important in the United States. There is current in the industry a strong movement in this direction."—*From the Cabinet Committee Report.*

9. Merchandising and marketing: It appears from the facts before us that much of the present system for the merchandising and marketing of cotton textiles is wasteful and involves undue hazards. We recommend that a study be made for the purpose of devising proposals for improving merchandising and marketing methods and that if necessary the Government assist through administrative and legislative measures in putting into effect such improvements as after due examination may be found to be beneficial. Any remedial measures must stop short of monopolistic organizations which might increase profits at the expense of the consumers.

A little old, and a little shop-worn, but still always a good subject for editorializing. . . . We ought to know!

10. Labor standards: We commend the attempt of the industry to maintain the labor standards provided in the code. We recommend that the Government supplement such voluntary efforts as are being made by such administrative and legislative measures as may be feasible. We recommend also, with regard to such legislation as may be proposed, a further study to determine the specific improvements in labor standards which may be in the public interest.

This recognition of the industry's efforts is gratifying. . . . The suggestion in the last sentence of the recommendation is too indefinite to permit comment.

11. Continuing committee: We recommend the establishment of a continuing committee consisting of representatives of the Government and of the industry, including labor and other affected groups, (1) to formulate in more concrete terms, methods of carrying out the above recommendations, and (2) to undertake a detailed examination of and report on the long-time problems of the industry, including its inter-relation with other phases of national and international economy. In formulating specific programs for the industry, it is essential that adequate information be made available as to capitalization, earnings and losses in the industry and their distribution.

We doubt that the industry could stand the shock of another committee just now. Better let it recover from this one first!

Delivery Dates . . .

Avoiding conflict between mill and selling office

By F. D. Manning

SALES departments like to make deliveries to their customers when the customers want them. Every mill would like to make deliveries that are satisfying to its sales department. This is possible, of course, if there is maintained an ample inventory of every construction and style. But risk, lack of working capital, and seasonal style changes work against this happy position. Practical operating calls for an endeavor to produce so that a majority of delivery requirements of customers will be anticipated and met; the inventory will not be excessive and will be liquidated at the end of a season; and manufacturing will be in quantities sufficiently large to get production at a cost in line with competition.

It is vital to profitable operation that the sales department and the mill work together to bring this about. There must be a clear understanding between the two: the sales department knowing just how far the mill is sold ahead, and what it has promised to deliver on each of the manufacturing orders it is producing; the mill knowing that, its position being understood, it will not be asked to do the unreasonable or impossible, and that dips in operation, causing higher costs, will be avoided as much as possible.

The Methods Now in Use

The means of endeavoring to get at this understanding vary. The usual methods are:

1. The sales department may send customers' orders direct, or issue manufacturing orders to the mill, giving deliveries wanted on these orders and depending on the mill to report what it will do.

2. The sales department sends manufacturing orders to the mill, and insists on deliveries in a standard time allowance.

3. The sales department endeavors to determine the mill's position as to delivery before sending the manufacturing orders, laying out and planning the operating of the mill in the sales department. It expects the mill to live up to delivery requests so made.

4. On staple constructions, the sales department and the mill, working more or less in cooperation, lay out general requirements. The mill reports its position weekly, on each of the constructions, showing production, looms running, and looms scheduled to run.

An examination of these four methods is interesting.

1. The sales department may send customers' orders direct, or issue manufacturing orders to the mill, giving deliveries wanted on these orders and depending on the mill to report what it will do.

Sending customers' orders to the mill, to be used by the mill to make up manufacturing orders, limits the mill to manufacturing against firm orders, and contains no specific sales judgment. Such sales judgment as is given is usually blanket, or of a spasmodic nature. Very often, as a measure of protection, the mill insists on the right to process no manufacturing orders below a specified quantity, usually at about the break-even point in cost, and hopes to be able to exceed this minimum. But delivery demands, and lack of—in fact impossibility of—knowledge of the construction or style from a sales viewpoint, tend to force the mill to work always on a basis close to the minimum it has insisted on, and as a result, on a basis of fairly high cost.

The sending of manufacturing orders covering customers' orders by the sales department to the mill does not bring in sales judgment as to just how much anticipation there should be for future sales.

Under both of these methods, the sales department tells the mill the deliveries it would like to have. The mill, in its weekly reports, tells what it is doing against the customers' or manufacturing orders. But there is no definite means of measuring, between the sales department and the mill, just where they stand, except such generalities as: the mill is sold up for six weeks.

2. The sales department sends manufacturing orders to the mill, and insists on deliveries in a standard time allowance.

Here again the mill often insists on manufacturing orders of at least a certain quantity, with the same results. It is only necessary to point out that once the amount of work ahead of the mill gets ahead of the human and mechanical possibility of keeping within the standard time allowance, the method goes to pieces, and unfortunately at the time it is most needed. This method tends definitely toward higher mill costs.

3. The sales department endeavors to determine the mill's position as to delivery before sending the manufacturing orders, laying out and planning the operating of the mill in the sales department. It expects the mill to live up to delivery requests so made.

This method more nearly approaches the desired position of a working understanding between the sales department and the mill. Manufacturing orders are placed by the sales department which usually take into consideration sales possibilities, and are sent to the mill with delivery requests which, insofar as the sales department can do so, allow for the amount of work ahead of the mill, and are therefore fairly reasonable in demands.

But a mill is usually at a considerable distance from the sales department, in more ways than one, and while a request for delivery may be made by the sales department after serious intelligent thought, the fitting of that request into the available equipment is not always possible. Manufacturing conditions, as well as sales conditions, must be lived with to be understood. Furthermore, this method leaves the mill in practically only a defensive position, that of having to explain why a request which has already been made, and which from the sales department's viewpoint looks reasonable, cannot be met. This may seem to be a good tactical position, but it doesn't get goods out of the mill any faster.

4. On staple constructions, the sales department and the mill, working more or less in cooperation, lay out the general requirements. The mill reports its position weekly, on each of the constructions, showing production, looms running, and looms scheduled to run.

This method is a rather loose tie-up between the sales

department and the mill, as often each wish to retain a certain amount of independence of action.

The discussion in this article is concerned with constructions other than staples, where the nature of the fabrics requires closer coordination.

A Suggested Method

By what means, then, can the sales department and the mill best understand each other, to their mutual advantage? There is probably no one way, but the method suggested below works very well.

The sales department sends manufacturing orders with deliveries wanted specified (never customers' orders) to the mill. By so doing, the judgment of the sales department enters into the quantity ordered. No manufacturing order can be placed calling for less than a certain quantity.

A weekly report, or "loom load," is made by the mill, to the sales department, showing the looms at the mill, by classes, and how their capacities are taken up by manufacturing orders already at the mill.

A "loom load" might look as follows:

LOOM LOAD

Class of Looms	Number of Looms	Looms scheduled week ending 7/13	7/20	7/27	8/3	8/10	8/17	8/24
A	100	100	100	100	80	80	60	40
B	50	30	40	50	50	50	20	..
C	20	10	10	10	5	5	..	..

Just what does this report mean, and what does it show? It means that the mill reports on July 6 that on class "A" looms, for example, of which there are 100, manufacturing orders of various constructions requiring this class of loom, and which are already at the mill, take up the total capacity of these looms for the next three weeks, and *it shows when, and how many, looms are available for new orders* after that time.

Thus, one "loom load" report enables the mill to make its position clear, and the sales department to see it. It is a composite picture, without details, of the work ahead of the mill on all constructions being manufactured, preferences included, and may be read at a glance.

Now, this "loom load" report orginates at the mill, and in making it up the mill has had to lay out and plan just what it will do on each manufacturing order, whether for normal or preference delivery, to develop the total picture, and has thus obligated itself to produce as it has planned. The "loom load" shows the over-all result of the responsibility the mill has taken on itself.

The sales department has a clear picture of conditions, when they want to place new manufacturing orders. There are looms available for new work, as follows: Week ending 8/3, 20 looms; 8/10, 20 looms; 8/17, 40 looms; 8/24, 60 looms. A normal delivery request should call for an output no greater than can be produced by this capacity. The sales department knows the class of loom and cuts per loom week of each construction, also minimum time required to get into production.

If, when placing a manufacturing order, a normal delivery, as disclosed by the "loom load" report, is not satisfactory from a sales viewpoint, a decision as to whether there should be preference authorized is necessary. This is the responsibility of the sales department. Knowing what manufacturing orders covering what constructions are already at the mill calling for this class of looms, how many are already on preference, and what delivery the mill has promised on them, the sales department has all the information necessary to decide:

1. Whether a preference can be asked without detriment to customers' orders already booked.

2. If a preference is necessary and must be made, just what constructions it is willing to authorize delayed.

The mill, on receiving the new manufacturing orders, checks to make certain as to its ability to make deliveries requested, accepts the responsibility, or advises the impossibility of so doing, and corrects the loom load in preparation for the next weekly "loom load" report. This is a logical way of doing it, for in the final analysis, it is the mill that has to produce the goods, and it is better to have the mill state what it can do, knowing the sales departments' wishes, and to have the responsibility of living up to it. This does not mean, however, that the mill can produce as it pleases, and the sales department must sell it. The sales department can only sell what customers want, and is trying to get the goods to them when they want them. They cannot keep the mill going profitably on any other basis.

In the same way, the sales department can see that on class "B" looms, due to time limitation for raw stock preparation, the available looms of the weeks of 7/13 and 7/20 are not usable, and not until the week of 8/17 can deliveries be expected, without preference.

On class "C" looms, time limitations for raw stock preparation is the only holdup on manufacturing orders for immediate delivery.

The method outlined above is not completely detailed. A fundamental working basis, only, is outlined.

In practical operation, the mill has to know how to make a "loom load" report that is accurate, and must so plan its production as to live up to the promises it has made. The "loom load" does not have to be made up new each week, but is a continuously operating report with an adjusting factor.

The sales department must know how to adjust its requirements on the load on the mill to best advantage of both the customers and the mill.

The method described above shows the two most interested parties, in one report, their relationship in their mutual problem. Each has to assume its own responsibility and live up to it. It may be applied as a standard report between the sales department and any number of mills on any number of constructions. It makes clear that very important point: the relative positions of the ability to produce, and the end of the selling season.

Do we have to

Move South?

—asks the wool industry

◆ *The New England and Southern editors of* TEXTILE WORLD *collaborated in the preparation of this article.*

THIRTY years ago there were 91 woolen and worsted weaving mills (excluding carpet) in the Southern States. Today there are about 40, including branches. Which proves that the mere location of a plant in the South does not magically lead to successful operation and that small and/or inefficient units (a great many of the plants running in 1905 had only five or ten looms and depended upon an uncertain supply of local wool) drop out of the picture there as elsewhere. Such considerations, however, fade into the background when we come up against the immediate situation where northern wool manufacturing interests have established three branch plants in the South in recent months and where more than one born-and-bred New Englander asks seriously, and rather sorrowfully, "Do you really think that we will have to move South?"

On the one side are calamity howlers, who predict that the woolen and worsted industry of New England is doomed. On the other side are the stand-patters, who erroneously state—as they did when large-scale migration of the cotton industry was threatened—that the South can never produce anything except the very coarse fabrics. The correct picture can be gained only by an impartial analysis of the facts.

As far as definite moves are concerned, the Uxbridge (Mass.) Worsted Co., already operating seven plants in New England, last spring purchased the Standard Cotton Mills, Cedartown, Ga., and the Adams-Swirles Cotton Mills, Macon, Ga. The first will be operated as Cedartown Textiles, Inc., and the second as Macon Textiles, Inc. All-worsted spinning and weaving will be done at Cedartown, where 72 broad looms and a considerable amount of new worsted spinning equipment have been installed. Cotton warps are made and dyed at the Macon plant, using much of the original cotton spinning machinery and a new dyehouse.

Another move is the recent purchase of the Adell Yarn Mills, Inc., Stony Point, N. C., by the Killingly Worsted Mills, Danielson, Conn. It is understood that 100 narrow looms will be moved from the northern plant, that the original Adell cotton machinery will be used to make cotton warps, and that worsted yarn will be shipped from Danielson for the present.

It is interesting to note that the plans of both Uxbridge and Killingly call for the production of cotton-warp worsteds and that L. Bachmann & Co., New York, act as selling agents for both concerns. Also that when Stiillwater Worsted Mills, Harrisville, R. I., established complete units for all-worsted fabrics, several years ago they went no farther south than Virginia.

The Outstanding Factors

With these examples to ponder over, and with the U.T.W. trying to stir up labor trouble in New England, it is small wonder that the question of migration is being debated on all sides. The following factors have an important bearing on the debate:

Labor Supply: There is an abundance of spare cotton-mill and farm labor in the South. There are a few dissenters, but the consensus of manufacturers is that such workers, properly trained, can perform any operation in wool manufacture. One manager, in fact, points out that the best finisher he ever saw was a clerk in a grocery store until he secured a job in the mill several months ago. The problem of training is difficult, of course, but at least such raw labor has no preconceived habits of operating that may be wrong, and, concerning work assignments, bases its opinion of what is a fair day's work on the amount of effort expended rather than the number of looms or spindles handled.

As there are relatively few woolen and worsted mills in the South, there is a shortage of skilled workers, such as loom-fixers, weavers, etc., The southern manufacturer is at a decided disadvantage in this respect, as he does not have the reservoir of skilled operatives that exists in such a city as Lawrence, for example. He must look out for his own labor supply and loses a degree of flexibility in operating. The question whether the South will ever be unionized is one that is beyond the scope of this study. The only generalization that can be made is that the general strike of last September showed that southern workers can get as wrought up emotionally as workers in other sections and that, therefore, almost anything can happen. It is certain, however, that one of the reasons for the present migration talk has been the antics of the U.T.W. in New England this summer.

Wages: The demise of the NRA has further complicated the already complicated wage question. Further, manufacturers are reticent on the subject. Northern mill men do not come out and boldly state that they are going to move South to secure lower wages. Similarly, southern manufacturers are not prone to boast that their wages are low. However, allowing for all differences between the various sections of the South, and between individual plants, it is a known fact that the southern wage scale, in dollars and cents, is lower than the northern scale. Wages paid in southern cotton mills—particularly in the skilled classifications—are lower than those paid in New England cotton mills. There is a further complication in the woolen and worsted industry. In New England, the wool industry pays higher wages than the cotton industry. For example, a loom-fixer in a Fall River cotton mill gets about $26 per week, while a similar job in a worsted mill pays about $32.50; a worsted weaver makes anywhere from $5 to $11 more than a cotton weaver. In the South, the woolen and worsted wage scale more closely approximates the rates paid in the neighboring cotton mills. One manufacturer estimates that a wool weaver drawing $28 in Massachusetts would get $18 in South Carolina or Georgia.

The question of mill village expense enters into any discussion of wages. The wool industry of the South follows the custom of giving low-cost rent, light, etc.,

and this must be considered as a part of the wages paid. Despite all such concessions, the generalization can be made that the South, either in comparison with northern mills operating their own villages or mills operating in large centers, has a definite advantage in labor cost. Such items as the relative cost of living, while important, have no direct bearing on manufacturing costs.

Raw Material: Many of the mills started in the South in the old days depended on local wool. Many fell by the wayside and some prospered and outgrew the local supply. At present, some of the fair-sized units use as much as 20% local wool in the production of coarser woolens, but some worsted mills find it necessary to import all raw material. In fact, all the wool raised in the South would supply only a very few of the larger plants. Some mills employ agents to purchase wool direct in the West, but this is not entirely satisfactory. Most of the better-grade wool still comes through Philadelphia and Boston. Under the circumstances, southern mills are generally forced to carry a large inventory of raw material to assure themselves of an adequate supply at all times. With the dominant Boston wool market at its back door, with a large assortment to choose from, and with quick delivery possible, New England has a definite advantage when it comes to raw material.

Overhead: Twenty years ago taxes were quite a bit lower in the South than in New England. Leaving out specific instances, this condition no longer holds true and the New England manufacturer will not benefit much in this respect if he moves South. Similarly, the spread in power cost has narrowed. As most woolen and worsted plants use process steam, power and heat are not as important as in a cotton mill with no finishing plant.

Distribution—Because of the relatively few wool mills in the South, no comprehensive study has been made of freight rates, but it is obvious that the nearness of New England to the New York market means definitely lower rates on finished materials. As already pointed out, New England is also, in general, better situated with respect to raw material rates. One factor that cannot be overlooked is that New England mills can ship to New York overnight. This may not mean much in transportation charges, but it is important considering the highly erratic character of the piece-goods market.

Special Considerations: The New England manufacturer owns his plant in New England. If he moves he must buy or build. Whatever he does he must spend money on a plant and money for the purchase of new machinery or the moving of old. Naturally, this acts as a retarding factor, particularly since little return can be expected on any property abandoned in the North. As a counter to this, a number of southern communities offer inducements in the way of tax exemptions, free rent, etc. Although not nearly as active as in the days of the cotton-mill migration, Chambers of Commerce still like to play with the idea of enticing new concerns into town. Power companies are probably the most interested parties in the endeavor to sell New England mills the idea of moving South. The "selling" goes on rather circumspectly and on a personal basis, however, as such proselyting is not in as good repute as it was some years ago. A number of towns have found that once concessions are given it is difficult to get them back.

Conclusions

From a study of the available evidence, it would appear that there is no more and no less reason for the wool industry migrating than there would be for a migration of the narrow-fabric industry, or of many non-textile New England industries for that matter. The dominating factor is labor cost. If there is continuing labor unrest in the North, and if the wage differential is large, the following conclusions are justified:

1. The shift from North to South will not be spectacular, as in the case of the cotton mills, as the advantages of a shift have been lessened with the passing of years. Any change will be gradual.

2. The lack of supply of skilled labor mitigates against the starting of many "native" southern mills. Establishment of plants under northern operating control (perhaps with help of southern capital) seems more logical.

3. Pulling up stakes entirely is quite a wrench and operating plants in both sections would present serious problems to many managers accustomed to a unit plant. For this reason concerns already accustomed to managing a number of units will probably be in the lead in establishing southern branches.

4. Coarse-goods mills are the most likely to move under present conditions, particularly plants using a percentage of cotton, although fine-goods plants can be successfully operated in the South.

Death at Pelzer

Results when employees try to go to work

ATTEMPTS on the part of regular workers in the Pelzer (S.C.) Mfg. Co. to return to their jobs on Sept. 2 led to skirmishes between those workers and pickets who tried to prevent them, resulting in the death of one woman and injuries to more than a score of persons.

The trouble in Pelzer began July 15 when a weaver was fired for insubordination. Forty-three U. T. W. members walked out in sympathy, the ranks growing later to about 275, it is stated. Governor Johnston of South Carolina ordered out the militia which remained until the last week of August when the Governor allegedly accused J. F. Blackmon, superintendent, with refusal to arbitrate. Mr. Blackmon denied the refusal and said that, in addition to earlier proposals to end the strike, he had agreed to take back those on strike who had committed no violence, and any others approved by the arbitration board. The U. T. W. declined this plan the night before the fatal shooting. The plant had continued to operate while the troops were there.

The Governor was requested several times prior to the shooting to order out troops. Finally, when he was notified of the rioting, he did so and troops arrived about noon.

Employees told our representative that the firing was precipitated by picketers stoning and shooting at a car driving through the picket lines. Skirmishes took place simultaneously at two plants and over 500 shots were fired.

Absence of troops to protect those who wished to work is regarded as primarily responsible for the tragedy.

"Strike Without a Strike"

◆ *This description of the "strike" situation at Strutwear Knitting Co., secured by special correspondence from Minneapolis during the "strike," is published not primarily as news coverage of this particular story, but rather as typical of the prevalent union custom of forcing employees away from their jobs, whether they like it or not.*—Editor.

STRUTWEAR KNITTING CO. of Minneapolis was closed and 1,133 employees thrown out of gainful employment by a ghastly repetition of the "strike without a strike" that is making Minneapolis notorious.

On Friday morning, Aug. 16, employees coming to work as usual were met by a mob of strangers picketing the plant. After an outbreak of violence in which the office manager was assaulted and badly cut about the face, the employees were forced to return to their homes. Neither employees nor officers of the company had any warning of impending trouble and no employees participated in the demonstration. According to an official of Strutwear, not over 25 employees at the most, out of 1,133, had any connection with the American Federation of Hosiery Workers conducting the strike.

The plant remained closed Friday. Saturday morning's first mail brought 549 letters from employees, joining with additional hundreds of phone calls denying any desire to strike and petitioning the right to return to work. Accordingly, officers of the company sent letters to Mayor Latimer and Police Chief Forestal demanding protection for employees who wished to return to work.

Referring to an offer of police protection, they said: "Assuming . . . that by adequate protection you mean that police officers will have instructions to assist employees in entering and leaving the plant, and not stand idly by and permit these unlawful acts to take place, we will attempt to reopen our plant on Monday and resume business. If you fail to furnish adequate protection, and if our employees are again assaulted and intimidated, we will be compelled to again close and remain closed until you demonstrate that you can enforce law and order in Minneapolis and can and will protect Minneapolis industry. If you feel you cannot properly protect our employees . . . let us know immediately and we will remain closed until you can assure us it is safe for us to open."

Upon promise of protection, the plant was opened an hour earlier than usual Monday. Employees gathered on distant corners and were rushed to the plant in guarded groups. The pickets became abusive and threatening and violence flamed when an office employee, assisting women workers to the door, was struck on the head and severely injured by a piece of concrete.

Upon leaving at closing time, violence again flamed and it was decided to remain closed until the situation was settled, inasmuch as a strong letter to city officials brought forth the excuse that the present police force was too small to cope with the situation.

During the violence, the leader of the pickets was identified as the V. R. Dunne who last summer led the bloody truck strike (distinctly similar in many details) that resulted in several deaths and many injuries. At that time, definite proof was published that Dunne was operating under direct instructions from Communist headquarters in New York and without the sanction of the national union leaders.

LOGIC—A One-Act Drama

Time: August, 1935.
Place: Greenville, S. C.
Setting: Telephone Booth.
Characters: John Peel, third vice-president of U. T. W., and a Reporter for TEXTILE WORLD.

SCENE I — Newspaper item: "Several Greenville mills have instituted drastic wage reductions and have placed workers on a new 'work-load' system, causing many to lose their jobs, it is charged by John Peel, third vice-president of the United Textile Workers." *(Dated Aug. 14.)*

SCENE II—Mr. Peel on one end of a telephone line and a TEXTILE WORLD reporter on the other end.

Reporter: "Mr. Peel, I noticed a statement in a New York newspaper, accredited to you, in which you charged several Greenville mills with drastically reducing wages. I understand that on several occasions you have charged these mills with increasing hours. Is all this true?"

Mr. Peel: "Yes. Absolutely!"

Reporter: "In that case, would you mind giving me specific names of such mills so that I can do a little investigating of my own?"

Mr. Peel: "I'll be glad to. Suppose I telephone you in the morning since I am leaving in a few minutes for Bennettsville."

Reporter: "Fine. Thanks. Then I'll expect a call from you in the morning. Incidentally, if I don't hear from you at that time, I'll call you back. Good-bye."

SCENE III—Same setting as Scene II. Next morning.

Reporter: "Good morning, Mr. Peel. Thinking perhaps you had forgotten me, I decided to telephone you and inquire about the list."

Mr. Peel: "What list?"

Reporter: "You remember, the list we were discussing *yesterday.*"

Mr. Peel: "I don't exactly recall what you are talking about. You'll have to be more definite."

Reporter: "Why the list of mills you said have cut wages and increased hours. You promised to let me have it this morning."

Mr. Peel: "Oh yes. That's right, so I did. Now let me see. Mmmm. I haven't had time to get up the list yet, but I'll give you the name of one outfit which has cut wages and increased hours—XXXX Cotton Mills. In the carding department, they have gotten rid of over 20 people."

Reporter: "But what about wages and hours?"

Mr. Peel: "Well, the people who didn't get fired are doing more work."

Reporter: "I mean in dollars and cents. In hours per week. Have wages been reduced from $12 to—say, $8? Have hours been increased from 40 to maybe 50?

Mr. Peel: "No—not that much."

Reporter: "How much?"

Mr. Peel: "Well, you see it's like this. The people who didn't get fired have been stretched-out. They are doing more work in the same time for the same money. Therefore, they are working more hours for the same money. In the same way, they are getting less money for working the same number of hours because they are doing more work. See?

Reporter: "Yes, Mr. Peel, I see. I follow your reasoning perfectly, and am looking forward to seeing the list of the other mills which have 'cut wages and increased hours.' Thank you very much. Good-bye."

Avoiding knots and loose ends in the weaving of

Seersuckers

By Thomas Nelson
Dean, Textile School,
N. C. State College, Raleigh

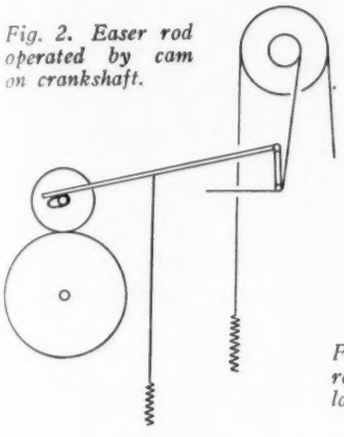


Fig. 2. Easer rod operated by cam on crankshaft.

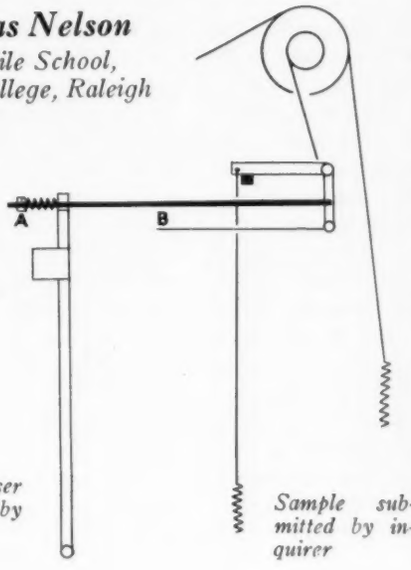
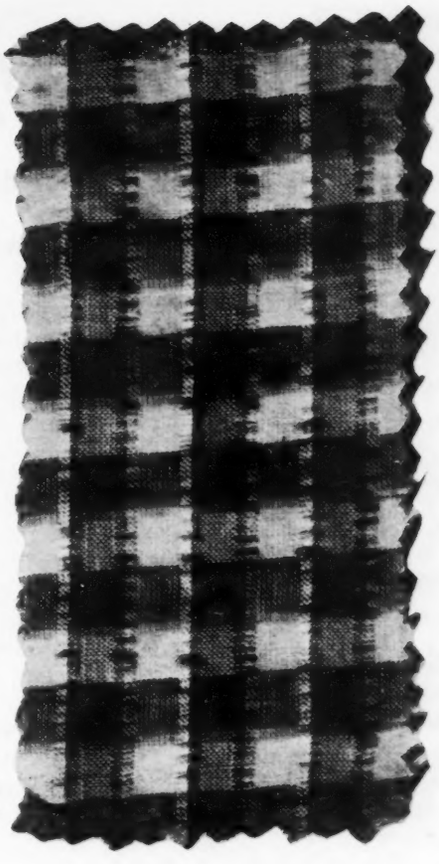


Fig. 1. Easer rod operated by lay sword.



Sample submitted by inquirer

SEERSUCKERS are proving to be a very popular type of fabric today, particularly when made from colored yarns in checks and plaids. Consequently I was quite interested when I received a letter from a mill man which contained the following:

"We are making a seersucker on six harnesses—four for ground or bottom warp and two for the top or crimp warp. The first four harnesses are doubled and working as two, with the last two for the crimp. The fabric is made on a cam loom.

"Many knots are made from waste and chafing. Another trouble is that one or two ends from the top warp get loose, and after weaving a few inches others get loose.

"The motion by which the crimp is made consists of a strip of leather from the lay to the crimp rod."

This letter, it will be noted, states that the fabric was made with six harnesses—four for the ground weave and two for the seersucker. The purpose of using four harnesses for the ground weave is, of course, to keep from crowding the eyes on the harness, and in this way assist in the opening of the threads to make a clear shed and better weaving. In making the fabric on a cam loom, the first two harnesses are fastened together and worked as one, and the second two harnesses are hooked up in the same way. The ends are drawn 1, 3, 2, 4. Practically all seersuckers are made by doubling the ends in the seersucker stripes, or using a ply end, as this assists in the making of the stripe.

The inquirer indicates that the back two harnesses are used for the seersucker stripe. I suggested to him that he try making the stripe with the seersucker harnesses in front. Of course, it is an axiom of weaving that the heaviest-weaving harnesses should be at the front, but exceptions can be made to this rule. If the front harnesses were used for the crimp, the ends would not have to be opened so wide for the shed as when the back two harnesses are used.

The method described in the letter—that of having a strap connected from the lay to the crimp or easer bar—is used quite often. As the reed comes to the fell of the cloth, the pull is made on the crimp bar and the seersucker ends are slackened. This is done while the filling is being beaten up; and because of this fact and because also the crimp ends are doubled, the seersucker or crimp is made.

Since the amount of "pull" which is given to the crimp bar affects the amount of crimp, it is possible that this is the cause of slack ends appearing in the fabric, as mentioned by the correspondent.

Then again, when crimp is being made by a motion, whether that used by the correspondent or some other, sufficient tension must be placed on the warp beam to permit the correct amount of slack for the crimp. If too little weight or too much slack is given, the ends will become loose. The crimp ends should come as straight from the crimp roll as it is possible to have them.

The timing of the shedding motion also has some effect on the amount of crimp put in the fabric. Recently a few tests were made with the timing of harnesses so that they would be level at different places, from bottom center to almost front center. The best results, as far as the amount of crimp put in the warp is concerned, were obtained when the harnesses were level with the crank near the front center.

Various other methods have been used to produce seersucker effects in fabrics, as explained in the July, 1932, issue of TEXTILE WORLD, page 73. One of these, which I consider one of the best, is illustrated in Fig. 1. This gives a positive pull on the rod and a more even crimp effect is made in the fabric.

Another method is shown in Fig. 2. The crimp rod in this case is operated from a cam on the crankshaft. Often crimp effects are produced by simply having the warp weaving slack.

Too Much Drawing

Worsted mills are simplifying the process

By H. A. Lawrence

COMPARED with the labor cost involved in the processes of spinning, twisting, and winding in the worsted industry, that involved in the drawing process is almost insignificant; and the comparative floor space, power, and maintenance costs are also small. Because of this considerable latitude has been, and still is, allowed in the number of machines and operatives employed to reduce a top to a spinnable roving weight.

The usual number of operations to reduce, say, a botany top of 256 drams per 40 yd. to a 3-dram roving can be averaged at nine, though this can be varied either way without any perceptible difference in the resultant yarn. This deviation from the average must not be extreme. It must take cognizance of those points which are essential in the production of a level yarn, of which the number of doublings and the draft imposed at each machine are the most important. Varying interpretations of the effect of these two factors have helped to create the differences which occur among mills in drawing the same type of material.

The amount of draft imposed cannot be varied excessively without bad results accruing, but the number of doublings at each machine seems to be capable of considerable variation. A reduction in the number of machines constituting a set of drawing should, theoretically, be noticeable in the yarn produced from it but little or no difference can be seen when the two yarns, one from the drawing before eliminating the unwanted machines and one after, are compared.

Many firms, noting this, have taken advantage of it to lower, slightly, already low drawing costs—the usual saving when two operations are omitted being an operative's wage plus the necessary power and maintenance costs required for the machines which are eliminated. The following example may help in indicating to those to whom this economic move appeals, the procedure necessary to eliminate redundant operations.

First, it is advisable to detail all relevant facts regarding the set of drawing which is to be modernized. This gives a tabulation of the character illustrated by Table I.

The machines to be dispensed with are now indicated. These must be machines whose elimination will not interfere with the progress of the bobbins down the drawing. For instance, it would be folly to cut out a machine and then find that the bobbins of the previous machine would not fit the creel of the subsequent one. The machines must also have a low dominant draft. If one with a high dominant draft were chosen, it would be necessary to spread the lost drafting power over the machines, thus creating drafts which are excessive.

The first two boxes in the set detailed in Table I meet these requirements and, as the first box is usually fitted with a creel, the second one can more easily be discarded.

The next three boxes are also near to fitting the specifications. Of these the two-spindle gill box is evidently indispensable. Therefore the other two—the first drawing box and the weigh box—must be considered. Here bobbin sizes come into play, and it is usually found that the first drawing-box bobbins are not suitable for use with the first finisher-box creel; consequently the weigh box remains and the drawing box is omitted. Of the subsequent machines none is suitable, as the dominant drafts are too high—unless coarser materials are to be processed, when higher drafts can be used.

With the second can gill box and the first drawing box withdrawn from active work, the weight of roving produced, with no alterations to either drafts or doublings, is much too heavy, being in the region of 4½ drams per 40 yd. This must be brought back to normal—*i.e.*, to 3 drams—by lowering the number of doublings; and this requires to be done correctly, or the machines will become unbalanced. The deliveries from the machines, in drams per 40 yd., must be kept as near as possible to the original weights, because any difference in delivery means a different production for the machine. Varying productions at each operation result in an unbalanced set of drawing which very quickly brings confusion.

It will be evident, if the trouble is taken to work out the delivery weights, that the biggest percentage difference is shown at the weigh box.

Therefore, with three ends up instead of four at this machine, a second calculation with the different doublings is necessary. This gives a roving of approximately 3 to 4 drams; but it can, by a judicious alteration of the drafts, be made into a 3-dram roving, giving a set of drawing as detailed in Table II.

It will be noted that, with the exception of the draft at the first can gill and the two-spindle gill, all the drafts are identical with those in Table I; and these two altered drafts are very near to the original drafts. The differences which occur in the delivery weights are also small; and in the first box the difference is counterbalanced by the increased draft, and in the second by increased speed.

The entire saving is small; and because of this it is apt to be ignored, but it is worth while to note that margins are small also. This method of cutting out needless expenditure is, of course, ineffective when colored lots are being processed and mixed in drawing; because the extra machines are needed for the mixing.

TABLE I

Set of drawing, reducing 256-dram top to 3-dram roving in 9 operations.

Operation	Machine	Doublings	Drafts	Delivery in Drams per 40 yd.	Dominant Draft
1	1st Can Gill Box	6	5	307	.834
2	2nd Can Gill Box	5	5.4	285	1.08
3	2-Sp. Gill Box	4	5.5	207	1.37
4	1st Drawing Box	4	5.6	148	1.4
5	Weigh Box	4	5.7	104	1.425
6	1st Finisher	3	5.8	54	1.93
7	2nd Finisher	3	5.9	27.5	1.96
8	Reducer	2	6	9.2	3
9	Rover	2	6.1	3	3.05

TABLE II

Revised set of drawing, reducing 256-dram to 3-dram in 7 operations.

Operation	Machine	Doublings	Drafts	Delivery in Drams per 40 yd.
1	1st Can Gill Box	6	5.5	280
2	2 Sp. Gill Box	4	5.6	200
3	Weigh Box	3	5.7	105
4	1st Finisher	3	5.8	54
5	2nd Finisher	3	5.9	27.5
6	Reducer	2	6	9.2
7	Rover	2	6.1	3

This article, based on studies made in England, substantiates some of the results obtained in recent experiments at Lowell Textile Institute (TEXTILE WORLD, September, 1934, page 106).

What Staple of Cotton

To afford good-running yarn of a given count?

By Carl D. Brandt
Head of Textile Department
Texas Technological College, Lubbock

◆ *Although the tests on which this article is based were conducted on Texas cotton, the conclusions will apply to other cottons in a general way. Thus the straight-line curve labeled "staple length" on graph No. 7 will be lowered if the cotton fiber is finer and possesses more convolutions, such as in the case of Egyptian cotton; and where the fiber is coarser, as in Indian cotton, the curve will be raised above that for Texas cotton. In other words, a finer yarn can be spun from an Egyptian cotton than from a Texas cotton of the same staple length, as the fiber of Egyptian is of smaller diameter. Other articles by Mr. Brandt, based on the same set of experiments, appeared in the February, May, and December, 1934, issues of* TEXTILE WORLD.

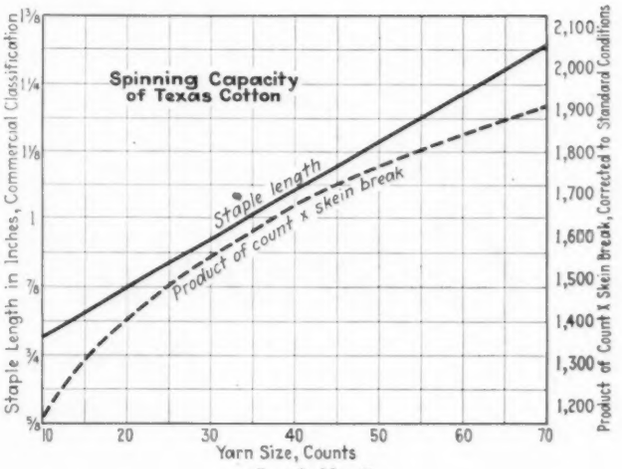
THE word "approximate" is used in conjunction with the term "spinning capacity" in dealing with cotton, because the variability of the fiber will always cause exceptions to and variations from any mathematical preconception of spinning. However, that should not detract greatly from the practical use of the information contained in this discussion.

The work forming the basis for graph No. 7 was carried out on a regular commercial scale. Carded yarns were spun, spooled, warped, and slashed. Some were also woven. The only point where the personal element entered was in the final judgment as to what constituted good-running work. Here the observer was called upon to set the dividing line between the good and the bad. Conclusions are not based solely on yarn strengths as determined in the testing laboratory. The results should fall well within the variations acceptable in most mills.

The curve for staple length on graph No. 7 gives the maximum spinning capacity of the various staples. For a given count, this curve also shows the staple required to spin a yarn of good-running quality. The dash-line curve gives, in the right-hand scale, the minimum products of count times skein-break for good-running yarn.

Assume that a 35s cotton is to be spun: Reading up from 35 at the bottom of graph No. 7 to the intersection with the "staple length" curve, and then over to the staple scale at the left, it will be seen that to spin a good quality 35s from Texas cotton would require fiber of 1 in. commercial classification. Referring to graph No. 6 (TEXTILE WORLD, December, 1934, page 75), to obtain 35s yarn of maximum strength with this staple, a twist of approximately 27 t.p.i. would be required.

As stated in a previous article, there are times when special softness or luster is required in the yarn, and in these cases the amount of twist will have to be slightly reduced resulting in a slight loss in strength. However, if spun with 27 t.p.i., the skein break should be at least 46 lb., or the product of the yarn-size times skein-break should be 1,600 or better.. This will be found to check with the product figure on graph No. 7, using 35s yarn.



Graph No. 7

From observation of the running quality of the yarn it was found that when the yarn strength fell below this value trouble might be expected in spinning, spooling, and warping. The plotted values of skein-break times yarn-count are not to be accepted as the maximum strength values, but rather as the lower limit of good-running work. Inferior cottons will sometimes produce yarns having strength below these values; and if such is the case, some difficulty may be expected when such yarns are used for warps.

Factors other than fiber length and twist (these are by far the most important) that influence the ultimate strength of a yarn are fiber diameter, strength, maturity, and uniformity of staple length. It is taken for granted that the proper organization and machine set-up are used in the preparation and spinning of the yarn. Yarns for filling may naturally be much weaker than those for warp; in other words, shorter fiber or less twist may be used to produce equivalent yarn counts.

From the equations of the various curves presented in these articles, some general formulas may be set up:

(1) Staple length required to spin a good quality of yarn = $0.7 + .009$ (Yarn no.)

(2) Twist per inch for maximum strength $= \dfrac{\text{Constant}}{\text{Yarn dia.}}$

(3) Constant for formula No. 2 = 230 — 98 (Staple length in inches)

(4) Yarn diameter for formula No. 2 in thousandths of an inch (this is as measured under the presser foot of a Randall & Stickney thickness gage under slight compression—it is not the apparent diameter) $= \dfrac{52}{(\text{Yarn no.})^{1/2}}$

(5) Predicted skein break (minimum) for good-running work $= \dfrac{670}{(\text{Yarn no.})^{1/4}}$

(6) Minimum product of yarn-number times skein-break = $670\sqrt{\text{Yarn no.}}$

As a demonstration of the comparative ease of using

the graphical method, we shall now apply these formulas to a 35s yarn.

(1) Staple length of Texas cotton required to spin a good quality 35s yarn = .7 + .009 (35) = 1 in. commercial staple length

(2) Twist per inch (figures obtained from formulas 3 and 4) = $\frac{132}{4.9} = 27$

(3) Constant for 1-in. cotton in formula No. 2 = 230 — 98 (1) = 132

(4) Yarn diameter in thousandths of an inch for 35s yarn (yarn under slight compression) = $\frac{52}{(35)^{2/3}} = \frac{52}{10.7} = 4.9$ thousandths of an inch

(5) Predicted skein break (minimum) for good-running work $= \frac{670}{(35)^{3/4}} = \frac{670}{14.5} = 46$ lb. or better

(6) Minimum product of yarn-number times skein-break = $670\sqrt[4]{C} = 670\sqrt[4]{35} = 670\ (2.43) = 1{,}628$

The close agreement between the graphical and mathematical solutions will be noted. A similar check should be obtained regardless of what yarn number is chosen for the test.

A series of yarns spun in the range from 10s to 55s form the basis of this entire work. The extensions of the curves from 55s up to 70s are such as to be in agreement with the central part of the curve. No definite proof can be offered to substantiate those points, but the values given seem quite possible and, furthermore, well within reasonable expectations.

This experimental work has not been presented with the idea that it offers hard and fast rules that are not subject to variations. All that is given here is a mathematical and graphical analysis of the facts as they were found to exist in this one instance. Possibly the deductions will be of value to some in checking and locating troubles which might be due to the quality and character of the cotton fiber used.

Colored Oil

Places the responsibility for stains and decreases their number

A GASOLINE filling station has no obvious connection with oil stains on cotton cloth, but it was the sight of a filling station that led J. Frank Morrissey, superintendent of Interlaken Mills, Harris, R. I., to devise a plan whereby oil stains can be identified and their number diminished.

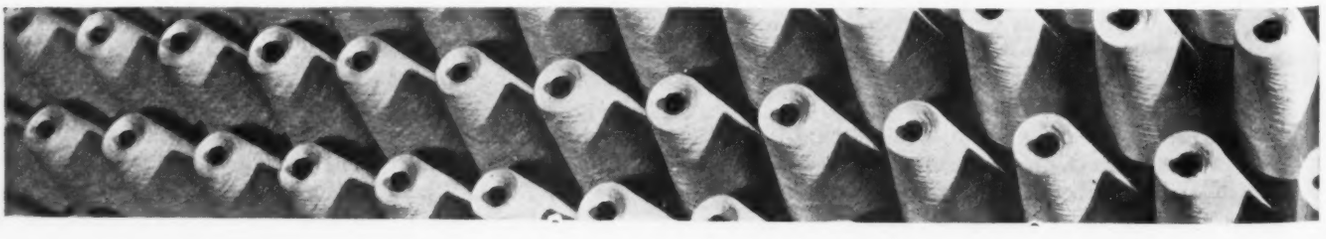
While driving to Providence one day, Mr. Morrissey pondered the problem of oil stains. Every Monday, when the overseers met him in the cloth room to look over the seconds caused by stains, there was considerable discussion about which department was to blame. There were honest differences of opinion, and—the overseers at Interlaken being as human as those in other mills—there were cases where there seemed to be a bit of old-fashioned "buck-passing."

Mr. Morrissey, on his drive, stopped at a gasoline filling station handling a number of brands. He noted that each brand was a different color. Having a bit of imagination, he wondered why it wasn't possible to color lubricating oil as well as gasoline. He started to investigate and the result was "colored" oil.

In the plan as worked out at Interlaken, all the oil used in the card room, including hangers, etc., is colored light green with a fugitive dye easily washed out. The oil in the spinning room is colored bright yellow. Yellow was chosen for the spinning room as it was found impractical to color the light spindle oil. However, the spindle oil itself leaves a yellow stain. In the weave room the oil is colored red. It would be possible, but rather difficult, to color black oil, but this was not done as it was found that 90% of the black-oil stains could be attributed to gudgeon-grease in the weave room anyway.

Several benefits have been obtained from the use of colored oil. Stains can be definitely attributed to the department responsible, and the cloth-room report shows so many yards of seconds due to green oil stains, so many yards due to yellow oil stains, etc. Under the circumstances it is only natural that each overseer tries to make as good a showing as possible, and the result has been a marked decrease in the total number of stains. Further, the identification narrows down the search when the number of oil stains is excessive. For example, in the early operation of the plan, it was found that green stains, caused in the card room, continued to be prevalent. The overseer knew that the problem was his own and found that cracked bobbins were responsible. Particularly where the bobbin was near sun or heat, the oil was drawn through the crack in the wooden bobbin on to the yarn. The number of stains dropped sharply when the defective bobbins were thrown away.

In order that there will be no question of the suitability of a certain dye for a certain oil, Mr. Morrissey believes that it is best to have the company supplying oil to the mill make a few tests and recommend the dyes to be used. The oil may be colored by the supplier or by the mill. At Interlaken the coloring is done at the plant. A bucket of oil is drawn from each barrel and brought up to 200° F, about a tablespoon-full of the desired dye is added and mixed, and the mixture poured back in the barrel, which is then rolled up on the rack ready for use.



NEW RAYON RECORD

Will be set this year in world and U. S. output

THIS is getting to be monotonous. Rayon's propensity to record-breaking performances is no longer news. In fact, the big news is going to come some year when it fails to set a new record.

However, this year's show is not without its thrills. Rayon production, both here and abroad, promises not only to break the 1934 record, but to smash it to bits. Both world and domestic output of synthetic fibers will probably be up about 20% for the calendar year 1935, as compared with last year.

Our own estimate of approximately 250,000,000 lb. for the United States output this year, as against 210,000,000 in 1934, almost frightens us. We had expected an increase, but not so large a one. The figure is based on actual performance during the first seven months of the year, given to us in confidence by nearly all the producers, supplemented by careful estimates for the last five months. Naturally, it is subject to revision, depending upon the course which business takes during balance of the year. Table III gives year-by-year comparisons.

It is interesting to note that official data on rayon consumption during the first seven months of 1935 show an 18% gain over the corresponding period of 1934; this checks remarkably closely with our estimate of production increase, as noted above.

Singularly, world production gives promise of increasing by just about the same percentage as domestic output. Figures for foreign countries, supplied us by our Manchester (Eng.) correspondent, plus our estimate for this country, indicate a 1935 world output of 959,580,000 lb., which compares with the revised 1934 figure of 789,589,000 lb. supplied by the same source last March. (See Table I and don't forget to take a look at Japan.)

Our Manchester correspondent also submits an estimate of world production of staple fiber in 1935. Comparison of his figure of 80,100,000 lb. with the 1934 total of 59,550,000 lb. compiled by *Textile Organon* indicates about a 35% increase this year. (See Table II.)

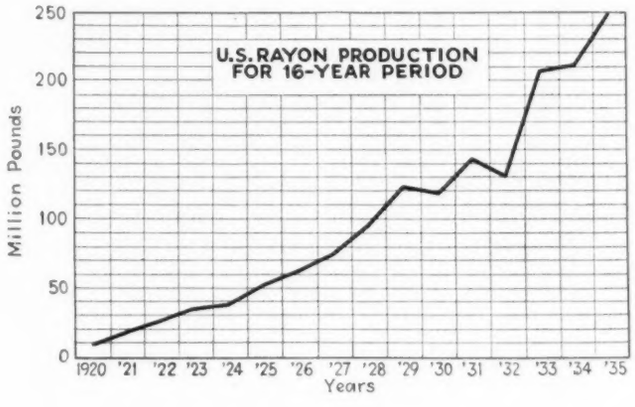


TABLE I—World Rayon Production by Countries (in lb.)

	1935	1934
United States	250,000,000	210,331,000*
Japan	210,000,000	150,194,000
Italy	116,000,000	106,546,000
Germany	110,000,000	91,410,000
Great Britain	110,000,000	88,870,000
France	75,000,000	64,900,000
Netherlands	21,000,000	21,010,000
Russia	11,000,000	11,900,000*
Poland	11,000,000	9,658,000
Switzerland	9,600,000	10,450,000
Canada	9,000,000	10,164,000
Belgium	9,000,000	9,416,000
Czechoslovakia	6,000,000	6,380,000
Spain	5,200,000	4,950,000
Others	6,780,000	3,410,000
	959,580,000	799,589,000

*From *Textile Organon*; all other figures are TEXTILE WORLD'S.

TABLE II—World Staple Fiber Production by Countries (in lb.)

	1935	1934
Germany	30,000,000	20,900,000
Italy	25,000,000	22,000,000
Gt. Brit	7,500,000	3,300,000
France	7,000,000	4,400,000
Japan	6,000,000	4,720,000
U. S.	4,000,000	2,200,000
Russia	.....	1,150,000
Poland	600,000	880,000
	80,100,000	59,550,000

Note: 1935 figures are TEXTILE WORLD'S; 1934 from *Textile Organon*.

TABLE III—Synthetic Fiber Production, 1920-1934 (in. lb.)

United States		World	
1920	9,000,000	1920	50,000,000
1921	18,000,000	1921	65,000,000
1922	26,000,000	1922	80,000,000
1923	35,000,000	1923	97,000,000
1924	38,750,000	1924	141,000,000
1925	52,200,000	1925	185,000,000
1926	62,575,000	1926	219,000,000
1927	75,050,000	1927	267,000,000
1928	97,700,000	1928	345,000,000
1929	123,000,000	1929	404,000,000
1930	119,000,000	1930	417,000,000
1931	144,350,000	1931	470,000,000
1932	131,000,000*	1932	509,000,000
1933	208,000,000	1933	660,000,000
1934	210,331,000*	1934	799,589,000
1935	250,000,000†	1935	959,580,000†

From the *Textile Organon*; all other figures are TEXTILE WORLD'S.
†Preliminary estimates.

Year's Technical Developments in

RAYON MANUFACTURE

By Harold De Witt Smith, Ch.E., Ph.D., F.T.I.

DURING the 1920's the rayon industry grew from the stature of a promising infant to that of a vigorous youth. Growth was based on the novelty of the new fibers and on the relatively high prices of the natural textile fibers which provided a good competitive field for the newcomers. During the first half of the present decade falling prices focused the efforts of every manufacturer of man-made fibers on the reduction of manufacturing costs. Now this second stage of growth has ended, and the industry is reaching a technical maturity. The intensive study of manufacturing methods during the last five years has not merely enabled the industry to live by keeping operating costs within the ever-narrowing boundaries imposed by the rapidly falling prices, but has opened vast new markets within the frontiers previously established by providing new and better types of yarn at these low prices. Costs have undoubtedly reached a bottom for the present methods of manufacture, and the margin of profit at present prices is uncomfortably small and in some instances non-existent.

In the last year some extensive additions to productive capacity have been completed, which undoubtedly embody the results of all of the engineering and chemical knowledge that has been gained during the depression. They will provide a firm foundation upon which will be based a further gradual improvement in manufacturing processes and a vigorous further advance in quality and in new types of yarns. Specifically, the year has revealed three developments worthy of note: First, the clarification of several basic patent situations; second, the successful use of yarns colored in the course of production; and, third, the serious acceptance of cut staple as a textile raw material. We shall touch on these principal points at appropriate places in our summary.

With rising prices of raw materials, the near parity which existed for a period between cotton linters and wood pulp is disappearing, and work on the further improvement of the latter is again being pushed. Furthermore, the efforts of Dr. Charles Herty to produce bleached paper pulp and rayon pulp from southern slash pine have culminated in the actual production of experimental quantities of viscose rayon by regular producers from a high alpha pulp produced in Georgia from slash pine. The analysis of this pulp, as reported, shows it to be well within the limits specified by American rayon manufacturers and better in most respects than the average figures for thirteen samples of pulp actually used by the industry. Despite the improvement in the quality of wood pulp for rayons, the acetate industry is still utilizing bleached cotton linters for the production of acetate yarns.

Improved Methods

Details of the improvements actually adopted in recent new installations of machinery for the viscose process are not yet available, but these new units undoubtedly embody the results of much published and unpublished work. An American manufacturer of rayon machinery is almost ready to announce a new type of cake-treating apparatus in which each cake is treated separately. This machine is said to represent a distinct advance over any method so far developed for aftertreating the cake from pot-spun viscose yarn.

A German study of the economies of pot spinning points out that a saving of 40% in initial plant costs can be obtained by designing for the optimum spinning speed. The cost of spinning apparatus decreases and that of the power plant increases with increasing speed of the pots,

" . . . to that of a vigorous youth"

and 16,400 r.p.m. is given as the optimum speed to permit lowest plant cost. In France the application of an electric current between one pole in the spinning solution and another in the spinning bath has been shown to affect the coagulation of the yarn and the spinning speed. The application of an alternating current in this manner is said to permit a higher spinning speed and to improve the uniformity of the yarn.

No details of the actual improvements in machinery or processes for manufacture of acetate yarn are available for publication. Nor does the literature contain any startling new ideas. The idea of spinning acetate yarns by the wet method seems to have been definitely dropped. This is undoubtedly because improvement in the physical properties of dry-spun acetate yarns (which are more economical to produce) has made unimportant the expected advantages of wet spinning.

The decision of the House of Lords in the final appeal of the English contest over the fundamental patents on spinning of acetate yarns has definitely placed this process in the same category as that of the viscose process, the basic principles of which are no longer secured to any individual manufacturer. Current patent protection in both processes relates to specific manufacturing details, rather than to the basic principles or methods of spinning.

The vogue for dull-luster yarn in both acetate and viscose processes has continued, and the rather complicated litigation over the patents for delustering the filaments by the introduction of white pigments in the spinning solution has been clarified to the point where many of the producers of dull yarns have been licensed by the holder of these patents.

In the cuprammonium field, the Furness process, which appeared to accomplish a revolutionary improvement in the method of manufacturing this type of yarn, has encountered many business vicissitudes since the first unit was built several years ago. It is believed, however, that this process will yet take a place of importance in the industry.

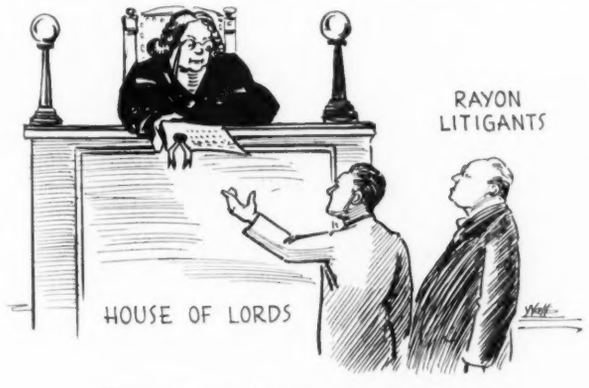
Yarn Properties

Turning to a consideration of yarn properties, we find more of specific progress to report. Foremost is the introduction to the trade of colored yarns which are made by coloring the spinning solution before the actual spinning of the yarn. In the acetate field, black yarn, which was mentioned in last year's review, is being successfully used both as stripes and decorations in woven and knitted dress goods and also in solid black satins and lining cloths. Large quantities of viscose yarn are being supplied in pink and in peach to knitters of underwear fabrics. Production of colored yarns in a few standard shades will undoubtedly increase to a factor of considerable importance in the trade, because the fastness properties of colors thus produced are excellent and the saving in dyeing costs is appreciable. However, the dream of man-made fibers supplied to the trade in all the colors of the ever-changing fashion rainbow probably will never be realized, because of the problem of yarn inventories and of forecasting the demand for various shades.

The steady improvement in the physical and dyeing properties of the several types of yarns has continued during the year and, as a stable or a rising price level permits the focusing of full technical efforts on the properties of yarns spun on the improved machinery, this upward trend of quality (and of the uniformity which already far exceeds that of any natural fiber) will undoubtedly continue. One of the phases of improvement in yarn qualities has been in the treatment of yarns for specific purposes. Especially in the acetate field has this resulted in the wider use of acetate yarns in knitted constructions for which it previously was little suited.

Rayon Staple

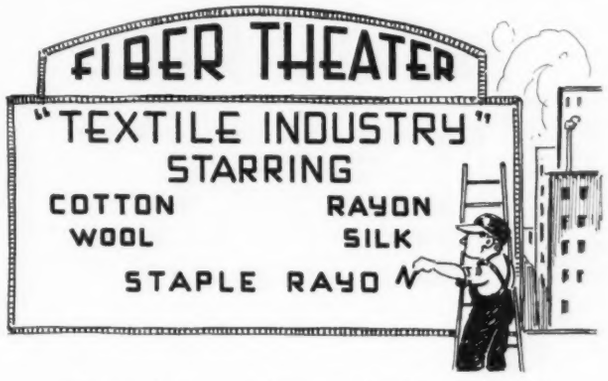
Outstanding among the year's developments has been the increased production of spun yarns made by cutting the man-made filaments into short lengths and spinning



"The decision of the House of Lords . . . "

these on existing cotton or silk spinning machinery. Spun yarns have been produced in relatively small quantities and used both here and abroad in a number of ways for some years. This year, however, has seen a marked development of new fabric types and structures based on such spun yarns, and yarns for these fabrics are being produced in increasing quantities both from viscose and from acetate staple, as well as from mixtures of these, which, upon cross-dyeing, give the "hairy" effects now in fashion.

There are many references in the technical and patent literature to methods of spinning large masses of filaments for staple purposes, for cutting or breaking such filaments into staple lengths during or subsequent to spinning, and for treating such cut fibers in order to pro-



"Outstanding among the year's developments . . . "

mote the spinning process. A German discussion of the ideal shape of staple fibers favors a fiber which is thickest at its midpoint, tapering toward both ends, and curled or waved toward the ends in order to provide a better grip of fiber on fiber in the spun yarn. Practical results to date have indicated that, just as in the case of natural fibers, the longest and finest fibers make the strongest and finest yarns.

Another development, which has brought the production of transparent wrapping materials into the textile fold, is the use of narrow strips of these materials as textile yarns. Ribbons of white and colored foil, of both the viscose type of material and also of cellulose acetate sheets cut to $\frac{1}{32}$, $\frac{1}{64}$, and even to 1/100 in. in width, are being used alone and in twisted combinations with textile yarns for decorating all sorts of fabrics, from hats and lamp shades to draperies and dress goods.

Other Processes

None of the other processes, which have appeared from time to time in laboratory or experimental form, have reached any practical importance during the year. The literature, however, continues to reveal that a great deal of work is being done on efforts to dissolve waste silk and re-spin it into continuous filaments. Spinning of gelatin into filaments has also been further pursued, but the newer knowledge of the structure of proteins revealed by X-ray and chemical analysis would seem to make this a hopeless quest from a practical standpoint.

A patent interesting for its novelty describes the formation of rubber or rayon thread by drawing a pen-like device along a groove in a receiving surface and treating the deposited material in order to set it before stripping it from the groove. Every such experiment on new materials or methods is a potential threat to existing methods and dangerous to a complacent industry. But the rayon industry, while alert and eager for new ideas, is mature enough now to concentrate on tried methods and to depend principally on the painstaking development of avenues which its technical experience has shown to be most sound and most promising.

NEW SALES SPIRIT . . .

Enlightened industry-consciousness has increased efficiency of rayon's merchandising effort.

THERE is one trait, more or less individual to the rayon industry, which at this time of the year always seems to associate itself in our mind with rayon merchandising. It merits consideration as an element making for increased efficiency in promotion. We refer to the tendency even among some of the industry's "rugged individualists" to recognize that many of their separate merchandising problems have a common basis. Now, before the brickbats start coming, let us explain at once what we mean—and don't mean. We *don't* mean to hint that there is any sinister merchandising alliance between companies. We *do* mean that in its merchandising effort the industry is moving definitely away from the old concept of cutthroat competition. It is understood of course that the first principle of a merchandising campaign is to make sales for the company financing it. Check on that. However, rayon companies also are coming to recognize a second principle, namely, that undue concentration to win momentary advantage over a rival firm is often less profitable than long-distance planning along individual lines.

This new spirit has been termed enlightened industry-consciousness. That it is something more than a figment of the imagination is evident when we study the industry's merchandising trend of the last year. Five aspects of rayon merchandising merit attention.

These are: (1) further progress toward making the Rayon Department an established division of the American department store; (2) increasing importance of the generic term "rayon" in trade and consumer merchandising; (3) clarification of the competitive relationship between the viscose and acetate yarns; (4) development of new, and expansion of existing markets; and (5) concentrated promotional efforts by producers in "backward" areas. The importance of these five activities is self-evident. Indeed, they have a double significance: first, they have brought profits and prestige to the individual firms sponsoring them; second, they have benefited rayon as a whole by waging effective war on the industry's common problems.

Let us examine them in sequence. For years—indeed, we might say, since the inception of the rayon industry—one major goal toward which merchandising effort has strived, has been the segregation and identification of rayon merchandise *as such* in the store. Retailers opposed this strenuously at first, but gradually through continued educational effort by producers this resistance weakened, and Retail Rayon Departments began to make their appearance in large stores. Progress in this direction has been much accelerated of late by the success of the Viscose Company in having stores install Crown Rayon Departments.

This campaign by the Viscose Company has progressed notably in late months; at present writing Crown Rayon Departments are established in scores of leading stores in 20 of the largest cities in the country. The significance of this development carries far beyond the scope of a single company: It means that the idea of a rayon department is more and more being inculcated in the retailer's psychology, thus helping to solve a problem which has tended to delay rayon's expansion.

As to consumer acceptance of the generic term "rayon," our second point, there are optimists in the industry who say "the battle is won," and that the term now is 100% established in the public mind. While we can dismiss that as obvious exaggeration, it is undeniable that developments in the last twelve months have materially strengthened rayon's prestige. Since January, the term "rayon" has received virtually world-wide recognition as the official designation for synthetic textiles. Nation after nation has discarded the term "artificial silk" in favor of the simpler term.

Perhaps most important for its effect on American opinion is the stand which France has taken; in line with governmental mandate the entire fashion world of Paris has adopted "rayon" and abandoned "soie artificielle."

The competitive relationship between viscose and acetate yarns which for some time was a source of uncertainty, especially to firms using both processes, now appears somewhat clearer. Consumer demand today is turning more and more to fabrics in which both yarns are mixed. Thus, the two tend to complement rather than to compete with each other. The trade is coming to recognize indeed that there is no need for viscose to crowd the acetate market or vice versa since each has definitely separate qualities and characteristics. One inter-

Crown Rayon Department, installed with cooperation of the Viscose Co. at the Broaday Department Stores, Los Angeles, Cal. This is one of several score of such departments in stores in 20 leading cities.

Typical boardwalk window display at DuPont Rayon Co. exhibit, at Atlantic City, N. J., which is changed periodically to reflect the newest trends. These exhibits attracted thousands of visitors during the year and made many new friends for rayon.

esting question as yet unsettled is whether firms producing yarn by both the viscose and the acetate processes should merchandise these yarns jointly or separately. Conservatives still incline toward continuing separate programs which has been the customary procedure; however, the trend now appears to be toward combining the two types of sales effort. Proponents of the latter method contend, and soundly, that it is rather impractical to conduct separate merchandising campaigns for two yarns which now are so frequently combined in fabric manufacture.

What about new markets and extension of existing outlets? This is the perennial question; indeed rayon is always going forward in such a multitude of new directions that any very extended recital of new uses might prove boring. However, the year has brought a number of developments too important to be overlooked. For example, the synthetic yarn, which hitherto had been selling chiefly for lightweight fabrics, now is being promoted in divisions where heavier fabrics are preferred. The current year's rayon fashions include numerous wool-like fabrics; some are 100% rayon; some are pleasing mixtures of rayon and wool. Reflecting the same trend, Lebotys of Paris has been successful with a spun rayon serge made of staple fiber mixed with wool. We may expect further activity along this line for 1936.

Since rayon now has entered, to some degree most of the major textile markets, it is logical that the present trend should be toward developing current profitable outlets rather than toward new uses which might prove commercially unimportant. The 1935 program in this regard presents a picture which is replete with variety and interest. Rayon merchandisers continue their efforts to enter the men's suitings market; progress in this direction is sporadic, but a certain advance toward solution of the more obstinate problems has been made.

Spun rayon leaped into the foreground this year as having important apparel possibilities, and it will undoubtedly appear in a wider range of markets next season. Other new fields in which rayon has made progress this year include: umbrellas, velvet toys, knitted millinery, embroidery, dress flowers, bedspreads, sponges.

It is typical of rayon's progress that we now find the industry seeking out "backward" areas for special promotional emphasis. Certain districts, such as the Atlantic Coast, are quite well "sold." Others, such as the Middlewest, need added effort to build consumer acceptance. During the last year merchandising departments have put forth special effort, such as fashion shows, store personnel education, consumer lectures, talking pictures, etc., in the "backward" districts, and this pressure has helped to increase demand for rayon merchandise.

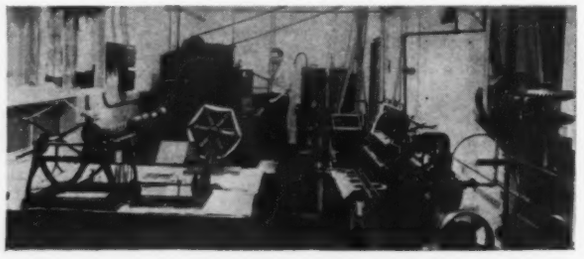
Another important aspect of the merchandising outlook for 1935-1936 is the export potential. While recognizing that the domestic market is still far from the saturation point the industry now is beginning to give serious attention to possibilities beyond the home borders. Indications are that 1936 may see the preliminaries of a real effort to build up foreign demand. Such effort to be successful should be restricted to the best qualities since Japan leads in exports of the lower grades.

Summing up, we find ourselves brought back to our opening keynote, namely, that the merchandising policy of the rayon industry in its broadest sense is becoming more balanced and more far-sighted; this is the result of better understanding among companies of their common problems. It constitutes a real gain, a tangible asset for the future. Already it has increased sales efficiency by reducing waste effort and it should serve further to improve rayon's sales position in 1936.

The trend toward combinations of synthetic yarns is a feature of rayon's current development. Bemberg and acetate are effectively blended in these smart pajamas. From E. Richard Meinig Co.

RAYON PULP *from southern pine*

By Chas. H. Herty
Director, Pulp and Paper Laboratory
Industrial Committee of Savannah, Inc.



EARLY indications of the successful pulping of young southern pine, free of heartwood, by the usual sulphite process, and the preliminary studies on bleaching them, naturally suggested the probability of their suitability for rayon manufacture. The fact that the bulk of rayon produced in the United States today is from mills located in the South in sections where the pine is the predominant tree warranted the economic soundness of the proposition.

Unfortunately, during the first two years of our experimental work here funds were not available for putting these thoughts into execution. However, when the Chemical Foundation, Inc., of New York came to our rescue so generously about two years ago the items of alpha cellulose studies and rayon production therefrom were included in the budget.

The first step was to find the best possible trained research worker in this field. We were fortunate in securing Royal H. Rasch, who for a number of years was a member of the research staff of the Brown Co. at Berlin, N. H., where he worked under the director of the laboratory, Dr. Geo. H. Richter.

In entering upon his work here Mr. Rasch began at once to seek the cooperation of all the rayon manufacturers, requesting from them samples of their alpha cellulose pulps in actual use and their methods of analyzing them. With the assistance of Rudolph Richter and Frank McCall of this laboratory he began a systematic study of the pulps followed by a similar study of various pulps from southern pine already produced here.

Following are the comparative average results of these studies on 13 commercial samples and four samples of easy-bleaching pine sulphite pulps made in our laboratory:

	Alpha Cellulose Content per cent	Copper Number	Cupram-monium Viscosity	Ash Content per cent	Ether Extract per cent
Commercial Rayon Pulps.	85.1	1.90	21.1	0.15	0.42
Southern Pine Pulps.....	87.6	1.35	26.8	0.29	0.42

With this evidence of satisfactory rayon pulp, samples were forwarded to the cooperating rayon manufacturers for their study and frank criticism. Fortunately, one of them possessed a small spinning equipment; and in a few weeks we received a beautiful specimen of rayon yarn made from our pulp, with a statement as to its very satisfactory properties for spinning.

The ash in our pulps was somewhat higher than commercial specifications, but this was readily traced to the washing of the pulp with local artesian water, which records show runs high in hardness. The prompt installation of a water softener removed this objection.

With funds available, about $5,000 was spent in the installation by our staff of a complete experimental equipment for the conversion of the pine pulps to finished rayon yarn.

Since that time Mr. Rasch and his assistants have been engaged in the study of pulps made entirely from springwood and summerwood, respectively, from fast-growing and from slow-growing pine from cooks made to different stages of easy-bleaching, on length of time for ripening the solution, etc. The studies have also been extended to alpha cellulose pulps made from the gum woods which occur so widely in the southern swamps, with equally successful results.

Our experimental work was first directed to a yarn of 150 denier 40 filaments, but during the last few months 150-denier 100-filament specimens have been produced. To carry the work still further a large number of successful dyeings of the yarn have been made.

An idea of the progress we have made is shown in the following table of tests on rayon yarn of different manufacturers, purchased in the open market, and rayon yarns made in this laboratory—three from pine and one from gum wood:

	Commercial Viscose Rayon Yarns				Southern Viscose Rayon Yarns			
Sample	A	B	C	D	63	55	57	44
Luster.....	bright	bright	semi-dull	dull	bright	bright	bright	bright
Denier.....	150	150	150	150	150	150	150	150
Filaments....	40	40	40	40	100	40	40	40
Tensile Strength*								
Dry.....	1.54	1.80	1.50	1.41	1.52	1.47	1.53	1.41
Wet.....	0.65	0.91	0.77	0.63	0.69	.66	.76	.63
Elongation†								
Dry.....	19.6	20.8	23.0	21.0	18.7	18.2	17.8	14.7
Wet.....	27.4	32.6	31.1	27.8	24.6	26.5	32.9	20.6

*In grams per denier. †In per cent.

Taking everything into consideration, I think it is a fair statement to say that these pine sulphite pulps have proved themselves fully suitable for commercial rayon manufacture.

As to the cost of producing rayon pulp from southern pine, the following itemized estimate shows the remarkably low figure at which this can be done:

UNBLEACHED SULPHITE:

Conversion costs:		
Wood (1.5 cords @ $4)	$6.00	
Sulphur (275 lbs. @ $18 per long ton)	2.21	
Limestone	.40	
Steam, for cooking and drying (10,000 @ .254 based on present costs of fuel oil of 18,500 B. t. u. and 80% boiler efficiency)	2.54	
Electric power—derived from drop in steam pressure	....	
Labor—including administration	3.30	
Repair materials	.50	
Belting and lubricants	.12	
Miscellaneous	.15	
Teaming	.15	
Liability insurance	.15	
		$15.72
Capital charges:		
Interest on investment @ 6%	$3.00	
Depreciation @ 5%	2.50	
Sinking fund @ 2%	1.00	
Taxes, insurance, contingencies, selling	3.00	
		$9.50
Total		$25.22
Bleached sulphite:		
Cost per ton of bleaching		$10.00
Cost per ton bleached sulphite		$35.22

Studies are being actively pushed in the laboratory and the results will be published from time to time. Meanwhile our laboratory and all results obtained are freely open to inspection to any interested parties. And, may I repeat here what I think is generally understood, there are no novelties, no patents, no restrictions of any kind in the use of any of the data we have compiled.

CREPES & CREPAGE

—*A Five-Part Symposium*

Crepes are the most temperamental of rayon products, requiring for best results the fullest exchange of information between the yarn manufacturer, the throwster, the weaver, and the finisher. Any one of these can counteract unwittingly the best efforts of all the others. For example, unless the yarn is right to start with and is thrown and woven properly, the finisher cannot produce the best results. Again, no matter how good the gray fabric may be, satisfactory results cannot be obtained unless it is properly finished.

Much of the trouble which has occurred in the past in the manufacture of rayon crepes has been due to the fact that the available knowledge on the subject has never been pooled. The throwster, the weaver, and the finisher each might be familiar with the factors influencing crepage insofar as they relate to the operations under his own jurisdiction. But he has not been thoroughly conversant with the problems of the others nor has he had an understanding of all the known factors involved in all the various operations.

It is believed, therefore, that this symposium will be of value to everyone who is interested in the manufacture of rayon crepes. The discussion is not intended so much to give detailed information on specific types of crepe yarns and fabrics, as to give the viewpoints of the various parties concerned in the fabrication of these products and to point out in a broad way just what each can do to influence the final results. In addition, is discussed the determination of crepage in rayon yarns and fabrics. Particularly, will be emphasized the necessity for the closest cooperation between yarn producers, throwsters, weavers, and finishers for the solution of their mutual problems.

Rayon Manufacturers' and Weavers' Views

By B. L. Hathorne

RAYON manufacturers undoubtedly have a much broader and more comprehensive view of the rayon crepe problem than any other individual group concerned in the many-sided business of designing, manufacturing, and selling uniform rayon crepe fabrics. Below will be found the views of the rayon manufacturers and the rayon weavers expressed during the course of interviews held for the purpose of accurately determining their respective viewpoints toward these creping problems.

Every rayon manufacturer has seen not once, but many times, shipments of rayon yarn identical from shipment to shipment produce uniform, acceptable merchandise in some instances, and highly unsatisfactory merchandise in others. More than one producer has encountered the phenomenon of the same yarn producing insufficient pebble, according to the claims of one fabric producer and too much according to the claims of another, both making fabrics very similar in appearance. Rayon producers are somewhat handicapped in their treatment of this problem, because they cannot afford to antagonize their own customers by calling specific attention to each of the many mistakes that are currently made in the processing of their yarns. Then, too, they are in the position of the man who lives in a glass house being afraid to throw stones, inasmuch as rayon yarns of all manufacturers vary somewhat within individual shipments.

Rayon producers realize that the method of sizing and subsequent processing may be so planned as to hide such minor variations as exist in the yarn (that is, prevent them from manifesting themselves in the finished fabric) or, through improper procedure, these minor variations may manifest themselves to a pronounced extent in the finished fabric. Rayon manufacturers realize that it is indeed a mistake to size all viscose process rayon with the same size in practically the same manner, because the resistance of the various rayons to the strain of a normal working load varies from one to the other—some require quite different treatment from others in order to produce the most pebble from the minimum amount of twist.

Producers further realize that although they have spent hundreds of thousands of dollars in the composite upon constant temperature and humidity apparatus (absolutely necessary in their opinion), many firms who twist rayon yarn not only have no controlled humidity, but in addition take yarn direct from the dryer to the winding room and wind and throw it as it comes along, no definite provision being made to allow the yarn to regain its normal moisture content (which of course varies constantly due to lack of proper control in many instances). Rayon producers, recognizing the importance of the creping problem, have made certain changes in their production methods in the direction of reducing the effect of factors of the problem that fall in their scope. For example, they have marketed for the crepe industry yarns twisted both right and left, because it was shown to them that yarn thrown through the zero twist point gave more trouble from variations in creping power than yarn twisted in the same direction as the original twist applied by the rayon producer.

Certain producers, at very considerable expense to themselves, have investigated in some detail the question of fabric construction and its relation

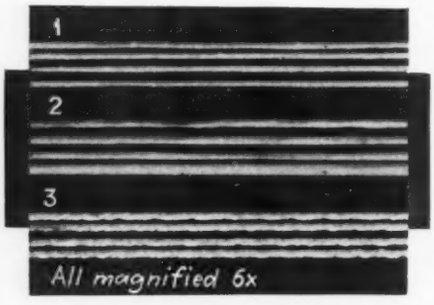
to the crepe problem. As a result, they believe a surprisingly large percentage of the total problems are due to constructions that have been designed with no thought to a "margin of safety" factor. That is, the creping power utilized is just barely sufficient to produce the necessary degree of creping when all conditions are exactly right. This condition not only permits, but causes, all variations in the rayon itself, in twisting and in processing throughout, to manifest themselves in the finished fabric as distinct fabric variations. A moderate factor of safety (additional twist and/or additional yarn, and/or additional width) definitely prevents minor and processing variations from manifesting themselves as serious variations in finished merchandise.

Rayon manufacturers see yarn copped in some cases in the direction of the twist, and in other cases in the reverse direction; in some cases under properly controlled tension conditions, and in others practically without control; in some cases under partially controlled humidity conditions, and in others with practically no control at all—all of which factors contribute greatly to the variations found in finished fabrics.

Further, rayon manufacturers have witnessed the growth of the embossing process that has become so widely used during the past two years, the main reason for its development and growth being that it materially assists in reducing the visible effect of variations imparted to rayon during the sizing, twisting, and subsequent operations. They have observed that some fabrics have been definitely reduced in ultimate wear because the embossing machine actually ruptured the filaments of the warp and/or filling yarns.

Specifically, rayon manufacturers expressed the following opinions: (1) It is possible to size and throw yarn in such away that minor variations in elongation or resistance to strain will not manifest themselves as fabric variations in the finished yarn. (2) Viscose process rayon from various manufacturers should be handled differently, each yarn being handled in accordance with its specific properties. (3) In many instances the sizing operation is carried out in such a manner that differences in crepe must result—proper technical attention is not given to the sizing operation in many plants. (4) The effect of humidity variations on the variation of pebble produced is so great that controlled humidity is essential in the production of uniform crepe (though rarely practiced). (5) A substantial part of the total crepe problem is due to the fact that many fabrics are designed and manufactured without sufficient provision for a "margin of safety" factor. (6) Rayon producers have shown their willingness to cooperate in the crepe problems that affect all branches of the crepe fabrics industry by producing rayon twisted in both right and left directions. (7) The copping operation varies from a carefully controlled operation in certain plants, tensions being uniform and yarn being copped in the proper direction, to extremely careless operations in others. (8) The entire embossing operation, its invention, development and growth is due to variations imparted to rayon yarns subsequent to the time these yarns left the rayon manufacturing plant. (9) The relative importance of the various variations discussed herein is not known nor are the permissible extremes within each variation known generally to the trade.

Rayon weavers have learned through experience that each denier, each filament count, each type from individual producers (bright, semi-dull, and dull), and rayon from each producer must be handled differently in order to produce satisfactory results and that the same effect cannot be expected when two rayon products that differ somewhat are handled in the same manner. Rayon weavers feel that the producers with their detailed knowledge of the properties of their various products should long ago have made these properties better known to the weavers, in order that they, the weavers, might size, twist, and cop to better advantage and might thus reduce their losses by many thousands of dollars annually.



1. 100-denier, 135-filament no-twist cuprammonium yarn.
2. 200-denier, 120-filament, 3-turns "S" initial twist viscose process, semi-dull.
3. Same as No. 2 except carries 48/50 turns "S" twist.

The weavers believe that to date they have borne most of the burden of designing new and attractive fabrics and utilizing new rayons as they have been produced, they have cooperated with their customers as far as possible developing fabrics especially required from the style viewpoint and that they have thus contributed materially to the advancement of the industry in the fields that are justly theirs.

Weavers further point out that many of the problems of the crepe industry are due to style demands requiring the production of extremely difficult constructions on the one hand, and to converters constantly purchasing cheaper fabrics on the other hand. This converter angle, many weavers state, is perhaps the biggest single factor contributing to the problems, inasmuch as properly designed fabrics, properly balanced in construction, containing sufficient yarns to make really good merchandise, have been found to be for the most part surprisingly free from the costly defects that have been encountered, particularly in the low-end types of the difficult constructions.

A contributing factor to many crepe problems, and one which the weavers admit falls more properly within their scope, is the effect of the warp sizing operations on pebble.

Most weavers were surprisingly well acquainted with the work of the United States Institute for Textile Research on the warp sizing problem. Those familiar with the work expressed the hope and expectation that the active cooperation of the various parties concerned, together with research by competent workers, will result in a much clearer understanding of the problems involved and will thus lead to better practice throughout the industry.

Specifically, rayon weavers as a group expressed the following views: (1) Crepe problems have cost most individual weavers many thousands of dollars annually. (2) The existing crepe problems have come into being partly because rayon producers have failed to fulfill one of their obvious functions, which is to provide the industry with detailed knowledge of the specific properties of the various rayons they produce, together with the specific knowledge of the manner in which the various yarns should be processed throughout the soaking, throwing, copping, and weaving operations. (3) Rapidly changing styles contribute to the problem. If constructions were more staple, even those weavers who work primarily by rule-of-thumb methods would have by this time eliminated the major causes of their troubles by trial and error methods. (4) Converters by their demands for unbalanced constructions and for specific effects in fabrics obviously designed too narrow and with too little yarn permitted in construction have been indirectly responsible for a surprisingly large proportion of the total troubles encountered. (5) Warp sizing and slashing operations are contributory factors to the crepe problems. (6) The warp sizing research of the United States Institute for Textile Research has already assisted the industry by stimulating research on the part of many individuals and by focusing attention on this problem. It is expected that even more valuable results will be obtained as the work which is now under way progresses.

Several rayon producers and rayon weavers expressed the opinion that rayon crepe problems must be reduced in the future by more active cooperation between the various contributory factors, including the dyers (whose important part is discussed later by another author). It is obvious that many would welcome a general symposium

that will allow the various views held by individuals and groups to be expressed and that will result in definite study of this problem, undertaken by a competent impartial investigator and directed by a properly chosen group from the industry. Such an investigation is definitely needed at this time and can accomplish a tremendous amount of real benefit for those interested in the various aspects of crepe problems.

Throwing Operation Is Crucial Point

By C. W. Bendigo

AT one time the throwster's chief responsibility was to produce a good-running yarn with the correct number of turns in it, but lately, and intensely so the last year, it has been his duty to see that he so processed the yarn that it would either give the final cloth a desired appearance or, at least, would assist the finisher to the same end. Unless otherwise noted, whatever statements follow refer to viscose process yarn only, because in several respects viscose and cuprammonium crepes respond oppositely to particular treatments. Other distinctions that might well be drawn now concern the three words of "crepe," "take-up," and "pebble." By "crepe" is meant both "pebble" and "take-up." By "take-up" is meant the amount the cloth or yarn will contract. By "pebble" is meant the character of the appearance of the cloth; that is, a heavy, wavy pebble or a fine, close pebble.

Production by viscose manufacturers of yarn with "S" and "Z" initial twists has been a great aid to the throwsters. Under the old system it was practically impossible consistently to produce yarn that would crepe uniformly. To put a reverse twist in the yarn, the initial twist first had to be taken out, which involved trouble and expense and also distorted the filaments of the yarn. These filaments naturally inclined in the same direction as their first twist. Reverse twisting also distorted the soaking materials in the yarn more than did regular twisting. The result was that this reversely twisted yarn tended to crepe differently from the threads which were twisted in the same direction as the initial twist. It is most fortunate that this condition has been overcome and the way is now clear for better crepage developments on the part of the rayon throwster than ever before. In fairness to the cuprammonium yarn producers, it should be said that their product has for a long time been available with no initial twist, and did not present this reverse-twist crepage problem.

The throwster's greatest control over crepe, except in the number of turns inserted, comes in the soaking bath. Here he can predetermine both the yarn's potential take-up and pebble. In all other operations within his scope he influences only the degree of the crepe, particularly the take-up, and not the pebble. When the number of turns remains fixed, the throwster can influence the potentialities of the rayon only slightly, except in the soaking.

At one time it was a generally accepted rule that the more turns put into rayon the greater would be the crepe, provided a certain limit for each denier was not exceeded. But now all well-informed rayon throwsters know that a yarn's creping power is determined also by the way in which it is soaked. It is entirely possible to make a 100-denier viscose yarn crepe more with 50 turns than with 60, by manipulating the baths in which it is soaked.

The general rule in soaking viscose rayon for crepe is: a low amount of gelatin and a high amount of oil for the greatest crepe. For cuprammonium yarn the opposite applies—a large amount of gelatin and a small amount of oil (or soap) for the heaviest crepe. The opposite of each of these rules holds true also. Of the ingredients mentioned, the gelatin has the greatest effect. In other words, a 25% variation in the sizing used would have more influence than would a 25% change in the lubricant.

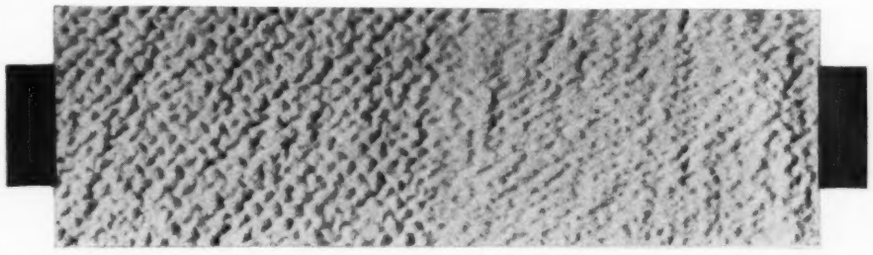
Extracting is an important part of the soaking operation, since yarn extracted thoroughly will crepe more than yarn extracted only lightly. This is because extracting to a low moisture content has the same effect as weakening the soaking bath. Variations in extracting have the same influence over crepage as variations in the soaking bath.

Beside the formula used in soaking, the ingredients employed have an enormous influence upon rayon crepage. For instance, a low-quality or an adulterated gelatin will give heavier crepes than the same quantity of high-quality pure gelatin. Use of gums or starches (dextrins) in place of gelatin tends to give heavier pebbles, but somewhat less take-up. Different oils used affect the crepe, but to a lesser degree. For example, coconut and olive oil combinations with lower percentages of coconut tend to produce heavier crepes, and highly sulphonated oils generally give more creping power to the yarn.

Crepage is affected by the materials used in soaking in at least two general ways: first, by the control they have over the yarn while it is in the process of being thrown and the latent possibilities they so give it; second, by the degree to which they either retard or enhance action in the creping or scouring bath. Only the surface has been scratched so far in the development of crepes through soaking and in studies and theories concerning this operation. The coming year is certain to see much that is new along this line, and it is possible that improved materials and new soaking ingredients now in the process of being developed for novel and more exacting effects will soon be made public.

Once the yarn has been soaked and the number of turns to be inserted has been decided upon, the throwster can do practically nothing in subsequent operations so far as determining the character of the pebble the yarn will produce; but he can influence slightly its potential take-up. Heavy tensions in winding from the skeins to the spinning bobbins resulting in true stretch, not permanent elongation, will give the yarn more possible take-up. Intelligent supervision is needed in this operation, particularly because uneven tension will result in variations in the finished cloth. Then, too, tension which at a certain humidity or degree of yarn moisture would not cause elongation might cause it at a higher humidity or higher degree of moisture, and the result would be less take-up and poorer pebble in the finished goods.

The same principles stated in the foregoing for winding hold true equally for



Variation in pebble due entirely to change in soaking formula

the spinning or twisting operation in throwing. The spindle speed, flyer used, machine set-up, etc., affect the crepage to the degree in which they affect tension. Of course, speeds which are too high for the denier or filaments of the yarn or the unwise choice of flyers will first make themselves known in poor running work. Cuprammonium yarn, although generally given slower spinning speeds, will stand higher twists, denier per denier, than viscose and so is able to give even higher crepes.

Steaming, or twist setting, so long as it only sets the twist and does not deaden the yarn or ruin any of the materials on it, has no effect upon creping power. If, however, the yarn has been steamed too long or at too high a temperature, the result is as one would expect—lifeless yarn, or at least yarn less lively, and insufficient crepe. It is important to allow steamed yarn to condition itself before being redrawn. This is necessary so that variations in the crepe will not develop because of uneven moisture content in the yarn subsequent to steaming.

Future throwing trends will almost undoubtedly be toward increasing crepage through soaking manipulations, because this will permit fewer turns, which will result in a decided saving in cost and in softer fabrics. Greater precision can be expected in the throwing of yarn for plain crepes or for constructions requiring a particular take-up or pebble to obtain a desired effect. However, there is at present a trend toward fancy weaves, such as "sawdust" and "oatmeal" crepes, in which the design determines the appearance of the pebble. Since these cloths do not require a thrown yarn with exceedingly precise specifications, their production gives the rayon throwster a breathing spell to develop formulas and techniques for the more particular work to come.

Crepe-twisted cuprammonium yarns have been pushed the last year in sheers and heavy crepes. When specially treated, this yarn will give heavier pebbles, denier for denier, than will viscose, despite the greater number of filaments in the cuprammonium yarn. Much experimentation was done to develop this heavy pebble, which is achieved by loading the yarn with all the gelatin possible and by using only a small amount of oil or soap in the soaking bath. As was stated under spinning, the fact that this yarn will stand more turns per inch assists in producing the exceedingly heavy pebble. The character of this pebble is deep and wavy with relatively few hills and valleys per inch. Cuprammonium yarn for sheers or crepe fabrics where pebble is not particularly desired is treated much as viscose rayon except that a somewhat stronger soaking bath is generally needed. The future of cuprammonium yarns in the crepe field is a matter of much speculation.

Warp Preparation and Weaving Important

SUPPLEMENTING Mr. Hathorne's presentation of the creping problem from the viewpoint of the rayon manufacturer and weaver, we are giving below a further discussion of the factors involved in the preparation of rayon warps and the weaving of crepe fabrics. This section has been compiled from data furnished by a number of men in various branches of the industry. It is important to note that several of the factors sometimes thought of as being under the control of the weaver, actually are more often under control of the converter. This fact cannot be ignored in any broad consideration of the subject of crepes and crepage.

During the last year it has been shown definitely that the warp-sizing operation is of prime importance in predetermining what sort of finished crepe will evolve. The beaming operation is of lesser significance provided, of course, that it is carried out intelligently with uniform tensions.

Insofar as it affects creping, slashing follows the same general rules for both viscose and acetate, but there are a few important exceptions. In the following discussion acetate and viscose both will be considered, unless it is specifically stated otherwise.

It has been found that in order to get the most satisfactory, uniform crepage it is necessary that the same sizing ingredient be used in both warp and filling. For example, if the filling has been soaked in a bath of gelatin, it would be unwise to size the warp with starch (dextrin). This is largely because the starch forms crystals on the yarn, whereas gelatin forms a film, and the two do not come out together in a creping or scouring bath. When the warp and filling do not boil off simultaneously, the one has the advantage over the other in forming the crepe, depending upon the ingredients used in each.

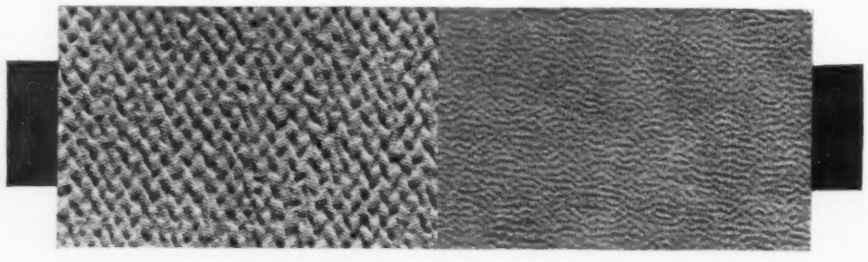
Uniformity in the amount of sizing on the warp is highly important, because the thicker the film the more it retards the swelling action in the creping bath. It is easy to see, therefore, why lack of uniformity will cause variations in the crepe. It is also evident why warps sized heavily will cause a poorer crepe than those sized properly.

The amount of stretch gained in slashing warps also exerts a pronounced influence on crepage. A stretch of 3 to 4% for acetates and about 10% for viscose rayons will give the best results and the most crepe, according to recent experiments. Less stretch causes the yarn to lie dormant, so that the warp and filling do not work together, the brunt of the creping being up to the filling. Excessive stretching causes cracks and unevenness and has the same effect as using a finer yarn.

Overheating or baking of either acetate or viscose warps while slashing naturally kills the yarn and results in less creping, uneven creping, and—on the whole—in an unsatisfactory piece of cloth. Of course, viscose will stand more heat than will acetate before being injured.

Closely allied with the heat factor is that of moisture content. Damp warps, as is generally known, will stretch and also cause other troubles. This stretching lessens the actual denier of the yarn and hence will not allow the same crepe results possible with the yarn in a properly dried warp. In this respect, acetate will stand a higher relative moisture content than will viscose, although acetate normally contains much less actual moisture than viscose.

From the weaver's viewpoint there are a number of factors not emphasized previously which have an influence on the take-up or pebble of crepe fabrics. For example, it is generally understood that the greater the number of filaments in a given denier of a specific brand of rayon, the lighter will be the pebble. It is known that a heavy sley gives less pebble than a light sley. In general, high twist gives a coarse pebble; low twist, a fine pebble. In the combination between sley and yarn size, a different pebble is obtained than would be expected, according to the weave only. A heavy sley, plus a fine yarn, gives a fine pebble; a light sley, plus a fine



Variation in crepe due to differences in construction of fabrics—Coarser pebble, 4S 4Z; finer pebble, 2S 2Z

yarn, gives a heavy pebble; a heavy sley, plus a coarse yarn gives a fine pebble; a light sley, plus a coarse yarn gives a heavy pebble. Furthermore, the crepage is influenced by the number of picks; too many picks per inch reduce the creping qualities and produce a finer pebble; if, however, the number of picks per inch is too small, slipping is produced. Again, the larger the number of picks in a band of filling, the rougher is the pebble; e.g., a 4 and 4 construction gives a rougher pebble than does a 2 and 2. As a rule, it may be assumed that a piece of cloth about 47 in. wide in the reed must shrink somewhere between 20 and 28 in. to show a desirable pebble after it is finished to 39 in.

At first thought it would appear that the most important single factor controllable by rayon weavers is the construction of the fabrics. Actually fabric construction is controlled largely by converters. Of necessity weavers manufacture the fabrics which converters order, even though they be unbalanced or are so constructed that they lack sufficient creping power to assure the proper effect being produced under all normal finishing conditions.

Factors which are under the control of the weavers include the following: (1) storage of thrown yarn before copping, (2) copping humidity, (3) copping tension, (4) crepe setting operation on copped yarn, (5) humidity of weaving, and (6) tension in weaving. Most weavers are aware of the importance of these factors and control them as well as their equipment and personnel permit.

Finisher's Control of Pebble and Take-Up

By Ray Cottrell

WHEN a rayon crepe fabric is immersed in hot water, the tightly twisted crepe yarns—because of their natural tendency to untwist—form loops, thus giving a pebble effect to the cloth and causing it to shrink. It has long been recognized that the finisher can control the degree of take-up or shrinkage. Until a little over a year ago, however, any attempt on the part of the finisher to modify the character of the pebble was usually disastrous. However, it is quite possible now to pretreat a gray fabric, which under previous conditions would have given a coarse, rough pebble effect, in such a manner that a smooth, firm, and finely creped fabric is obtained. This operation is essentially a "dry-finishing" one and consists of processing the goods through an embossing calender, prior to any wet finishing.

The embossing calender consists of an engraved steel roller, capable of being heated internally, against which impinges one or two larger gear-driven paper rollers. The three-bowl calender is recommended as giving more variety of results and is capable of producing permanent results without necessitating excessive pressure between the rollers. A steaming device is fitted to the embossing calender or is run in sequence with it. In some cases the gray goods are merely spray-damped, the finisher relying on the steam, formed at the surface in contact with the heated steel roller, to produce the desired effect.

This method of operation relies solely for its efficacy on the fact that rayon of all types is more or less plastic when moist, and is capable of permanent deformation or of retaining an impression, such as that induced by the engraved steel roller. This impression is more permanent if the rayon fabric is processed at a comparatively high temperature and pressure. Great care must be exercised in embossing to avoid permanent damage to the fabric.

Cellulose acetate, being more plastic than the other types of synthetic yarns, lends itself better to this method of pretreatment, although viscose crepe fabrics are embossed also. Due to the plastic nature of the rayon, wherever the yarns contact the engraving on the steel roller, they become anchored or "set." The crepe effect may be said to be practically under mechanical control, for the engraved roller is readily substituted by another of a different pattern. There are many finishers who believe that if the regular processes are carried out efficiently, there is no need to emboss; there are just as many, if not more, who maintain that it is essential to emboss. Strangely enough both may be correct, as many finishes are of a plain rough coarse nature and if handled carefully do not require embossing. On the other hand, embossing practically insures freedom from breaks and uneven creping and also allows of a variety of finishes from any given gray construction. In addition embossing removes those hard creases and folds caused by faulty put-up of the gray goods. For this latter purpose, a thorough steaming or damping is necessary before embossing (an ordinary steel-paper calender is quite sufficient for this process only). In addition to the stipple design used in the embossing process outlined above, various floral and novel patterns are used to produce permanent embossed effects upon the finished crepe fabric.

The percentage of take-up or shrinkage in a finished rayon crepe of any given construction is determined largely by the method of boiling-off or creping and the amount of tension applied in drying and tentering. The constitution, temperature, and concentration of the boil-off bath; the type of equipment used; and the length of time taken for creping all have an effect on the take-up. No definite rules have been set down covering these phases, and each finisher, through experimentation, determines the procedure which gives the best results in his plant on a specific fabric. This procedure is then followed on subsequent lots of the same construction from the same manufacturer. With new fabrics, if the finisher is not furnished with full details concerning the type of yarn and way in which it was thrown, construction of the cloth, exact finish required, etc., many tests may be necessary. If the gray fabric is not correct in every particular, the finisher may find it difficult, or even impossible, to remedy the faults.

There are several methods employed for boiling-out or creping, the choice being determined largely by the construction of the fabric being processed. Among the more important of these are the skein or book-form method, the string method, the continuous method, the dashwheel method, the jig method, the star-wheel method, and the reel-dyeing machine method.

The skein method is the one most commonly used and the procedure followed will be outlined briefly to show the various factors involved. In this method each piece is wound in skein form on a collapsible reel, transferred to two V-shaped rods and completely immersed in the creping solution, which is contained in a rectangular tank, usually of approximately 3,000 gal. capacity. About twenty pieces are treated at one time.

The one thing which finishers are in agreement on is that water alone is not the best creping medium, a solution which will penetrate the fabric and lubricate the yarns being preferable. A solution which has detergent properties is also desirable, as in most methods the creping operation is used, not only to induce shrinkage, but also to remove the impurities from the fabric.

In the skein method, for example, low-titer soaps or corresponding assistants are commonly employed: for viscose rayon crepes about 5 grams per liter; acetate/viscose, 5 to 10 grams per liter; acetates, 15 grams per liter; and for acetate/silk, 20 to 25 grams per liter. Time varies from about 1 hour for viscose rayon crepes to 2 hours for those containing acetate and to upwards of 3 hours for those containing silk. For average fabrics, the starting temperature should be about 80° c., raising to just below the boil, and maintaining at that temperature for 1½ to 2 hours. The boil-off liquor may be used as a standing

bath for as many as five batches, although it should be replenished with a small amount of fresh liquor after each batch.

Too much shrinkage must be avoided, or the fabric will sag after being finished and made up into garments. On the other, if the goods are not shrunk sufficiently, they will shrink further upon laundering. Again, uneven shrinkage spoils the appearance of the fabric. Uneven shrinkage traceable to a fault in the gray goods can sometimes be avoided by gray calendering or embossing. If it is due to improper creping methods, the finisher must modify his process, possibly by starting the boil-out cold and gradually increasing the temperature.

On some constructions it is the practice to pad the fabric through a 2% solution of caustic soda and then allow it to stand for 30 min. loosely piled before creping. Caustic is also used frequently in the continuous method, the goods being padded with caustic and then led onto an endless traveling mesh or an inclined glass plate, washed, soured with dilute sulphuric acid, again washed, and transferred to a reel machine or a rope soaper for the actual scour. Goods containing acetate are sometimes padded through a solvent (e.g., xylol and sulphonated castor oil soap) and allowed to lie for about an hour before boiling off.

In dyeing, printing, drying, and tentering, the chief precaution to be taken is to avoid excessive tension, which would counteract the effect of the creping operation. Temperature of drying, degree of extraction, use of softeners or other finishing agents, etc. have an effect on the final appearance and handle of the goods. This is true of other rayon fabrics, however, and is not peculiar to crepes.

In the past whatever the procedure employed for finishing rayon crepes, it necessarily has been based on the trial and error method. Today we are coming to better understanding of all the factors involved in the manufacture and processing of crepe yarns and fabrics. We anticipate, therefore, the development of standard methods which will simplify the problems of the finisher and give better and more uniform results.

Determination of Crepage in Yarns and Fabrics

By Irving J. Saxl

AT present two methods are in common use for determining the shrinkage of crepe fabrics. These two methods differ in detail, but in each the amount of shrinkage is found by treating a measured sample of fabric in a hot soap solution, drying, and measuring. The procedure most frequently employed is to take a strip of fabric about 12 in. wide and the whole width of the cloth, treat it in soap solution at 180° F., remove from the liquor and press between the hands without stress, allow to dry flatly, measure from selvage to selvage, and compute the shrinkage. These methods are tedious and undesirable for a number of reasons. For example, it takes quite some time until a piece of yarn is woven into the form of a sufficiently large cloth sample and additional time elapses until the specimen is cut off the loom and tested. This lapse of time between the manufacture of the yarn and the cloth interferes with efficient production testing. Moreover, these methods are too expensive to permit the use of enough samples to guarantee uniform production by a sufficient number of routine tests.

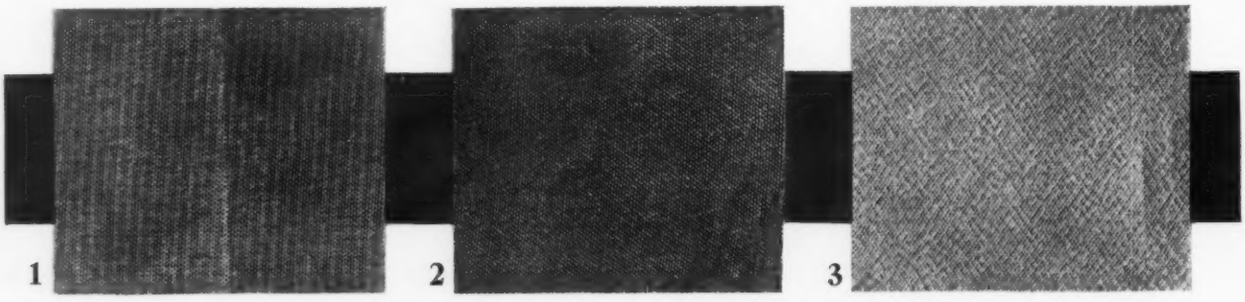
It seemed imperative therefore, to devise a method for determining the creping qualities of a yarn before its entrance into the cloth. With this in view, a new testing device has been developed which makes it possible to predict the behavior of the individual yarn before it is woven into the material.

A photograph of the complete crepage tester (patents pending), as used in the laboratories of the Waypoyset Mfg. Co., is shown in Fig. 1. A diagrammatic view of the apparatus is shown in Fig. 2. The yarn, which is held stationary in a lower clamp, 1, protruding from the square rod, shown in the center of the picture, is held on its upper part by a movable clamp, 2. This clamp is partially counterbalanced by a weight, 9, so that the yarn suspended is slightly stretched between a rigid and a movable holder. If the yarn contracts when submerged in the boil-off solution, the movable holder moves in the direction of the stationary clamp. The contraction of the yarn is measured on the rotation of a drum, 5. In another construction, it is possible to keep the boil-off solution stationary and to immerse the yarn.

A reset screw is brought out in front of the dial so that the movable clamp can be easily set to zero position. In actual practice, a length of 50 cm. of the yarn is used. This length is indicated by a pointer, rigidly attached to the stationary holder of the yarn. The movable clamp is brought in alignment with this pointer, and the yarn (which has been previously fastened to the lower clamp) is now attached to the upper clamp and thus, over the tape, 3, to the weight of the counterpoise. The dial hand, 7, with balancing weight, 8, is thereafter set to zero. In this condition, the pointer will move clockwise if the yarn is submerged in the solution. The readings on the dial are taken directly, in centimeters, and if multiplied by the weight lifted, give the contractive power of the yarn, in terms of work.

The power of contraction of the yarn is measured directly, in terms of the physical dimension of work. If the counterweight, P, is lifted a given distance, L, the work, W, done by the crepage of the yarn equals: $W = P.L.$ The length, L, can be read with exactness on pointer 7, inasmuch as 7 has approximately three times the diameter of inner drum 5.

The choice of the counterweight (designed in the form of interchangeable riders) depends upon the construction



Different effects on same fabric obtained by variation in finishing procedure. 1. Gray goods. 2. Half-shrunk, little pebble, will shrink further upon washing. 3. Full-shrunk, pronounced pebble, will not shrink or sag when washed or made into garments.

of the yarn. The weight must be heavy enough that the yarn does not show kinking; on the other hand, it must be light enough so that the counterpoise still can be moved. In actual practice, three different counterweights are being used. With the proper choice of weights, it is thus possible to differentiate between intake and take-up. The heavier weight will permit the yarn to contract to its first saturation, while the lighter one will permit kinking and heavier creping. With the term, counterweight, is described the detachable overweight 9. This is greater than the weight which balances clamp 2. The following weights, in the form of aluminum riders are used: 0.3 gram for 22s spun rayon; 1 gram for 100-, 150-, and 200-denier viscose and acetate yarn and for 14½s spun rayon; and 2.5 gram for 2/100-denier yarn. With the 1-gram weight, which is used most commonly, readings of the dial can be used directly. Only for very soft yarn, of extremely low contractive powers and, on the other hand, for particularly strong yarn, the multiplication with 0.25 or 2.50, respectively, is necessary.

For the sake of simplicity and speed, the crepage of the yarn is read while it is wet. For precision measurements, or for determining the relation of contraction between the wet and the dry yarn, it is possible to dry the yarn in its movable holder with a hot-air dryer and to take readings of the yarn when dry.

For keeping the temperature of the boil-off solution constant, the latter is heated electrically and the temperature maintained thermostatically within a precision of ± 0.5° F. The usual boil-off temperature is between 190 and 210° F. For maintaining the level of the boil-off solution within the tank, a leveling glass, 16, may be attached to the tank, and for facilitating a change of solution, a faucet, 12, is attached to the bottom of the tank. It is understood, of course, that the weight of the tank is counterbalanced by the counterpoise, 11.

A diagrammatic sketch of the automatic heating device is shown in Fig. 3. The coil, 14, is submerged into the boil-off solution, the current passing on one side over the thermostatically controlled contact, operated by a bi-metallic spring, 13. A double contact, *D* and *E*, is opened or closed, respectively, if the bi-metallic spring expands or contracts and thus rotates an arm, *A*, attached to one side of it. Condensers *G* and *H* are put in parallel to the contacts to reduce arcing to a minimum. A small Neon lamp, *K*, is placed parallel to the heating coil, so as to indicate whether or not current passes through the heater. It may be mentioned that this thermostatic regulation is of a strictly mechanical type. By duplicating the area of current interruption, a distributed load of only about 2½ amperes per contact has been achieved, which is a reasonable load for continuous service. It has been possible thus to avoid the use of intri-

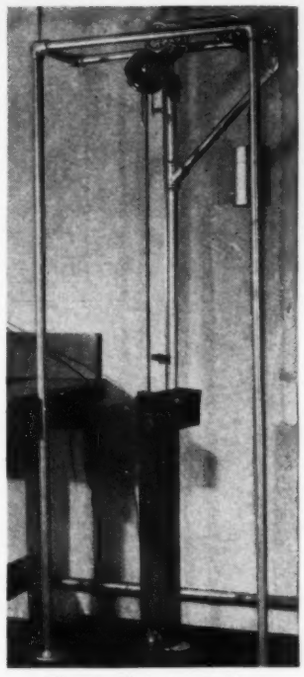


Fig. 1. Crepage tester

cate secondary relays for the current control.

With the machine, one can determine whether or not a given type of yarn will produce sufficient contraction upon boil-off, so that the final cloth will show the desired pebble. If the contraction of the yarn is known, and shows what has been experienced in a previous piece of material to produce a certain pebble effect, it is simple to check new lots of yarn and to ascertain whether they still have the same contracting power. If they have less, additional turns twist may be necessary; if they have more, the number of turns may be reduced, additional steaming introduced, etc. The instrument assures uniform contracting powers of the yarn which is finally permitted to go into the cloth.

In addition to measuring the crepage of individual yarns, precisely and quantitatively, it is possible, with an analogous apparatus, but having heavier counterweights and somewhat sturdier total construction, to measure the contraction of a whole piece of cloth. A strip of cloth is taken, for this purpose, and inserted in the machine.

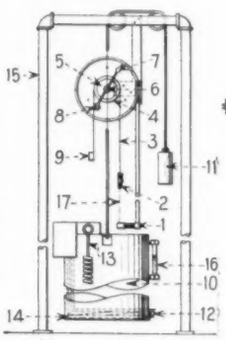


Fig. 2. Schematic diagram of working arrangement

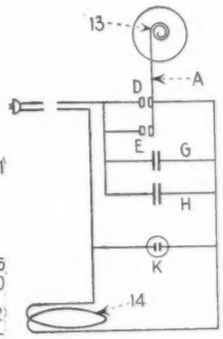


Fig. 3. Wiring diagram of heating circuit

The following instances show where the crepage tester proved to be of value in settlement of claims. Yarn received from Manufacturer *A*, gave good results, crepage and the pebble produced were satisfactory. Under analogous conditions of twisting, steaming, and weaving, the cloth woven from yarn received from Manufacturer *B* showed no pebble. The producer of yarn *B* attributed this lack of creping to faulty weaving or finishing. The following table shows the results of crepage tests of the two products; each figure is the average of 10 measurements, so that the 12 figures shown in each column are representative of 120 actual tests.

Yarn B		Yarn A	
0.47	0.43	1.39	1.105
0.45	0.68	1.375	0.955
0.475	0.485	1.13	0.69
0.46	0.50	1.08	1.53
0.48	0.505	1.335	1.02
0.41	0.375	0.94	1.64

As can be seen from the above, yarn from manufacturer *B* creped considerably less than that from manufacturer *A*, irrespective of weaving and finishing.

The crepage tester also makes it possible to determine, even after the yarn is woven into the cloth, whether or not its original and inherent creping qualities were proper, as the cloth may be opened and single ends taken out and tested.

Another instance where the crepage tester proved to be of definite value was when the excessive crepage of 200-denier yarn was checked. Increase of tension and the various changes usual in the weave shed did not produce results. The laboratory received samples of the material and found the following figures.

Breaking Strength	Elongation	Crepage
330	25.0	6.80
350	27.5	5.80
305	23.5	5.90
325	26.0	4.40
350	28.5	1.40
350	29.5	6.60
350	25.5	6.80
360	25.0	6.50
350	26.5	6.00
340	26.5	6.30

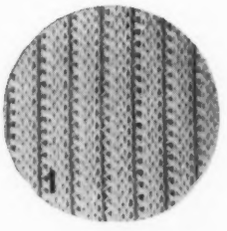
When a sample of the yarn was tested in the crepage tester, a considerable work factor was found on this yarn, as shown in the third column. Crepage occurred as high as 6.8 grams-centimeter. When this result was found, with the tester, reduction of turns twist was recommended; turns twist were reduced from the original 45-50 to 40-45. The following table shows the results for these lower turns twist.

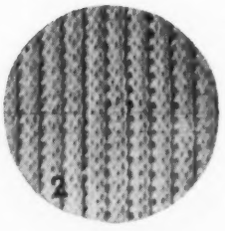
Breaking Strength	Elongation	Crepage
360	28.0	2.30
350	27.5	2.40
340	28.0	1.80
350	30.0	2.00
370	26.0	2.10
365	27.5	2.00
360	27.0	2.50
350	26.5	2.30
330	25.0	2.40
340	25.0	2.20

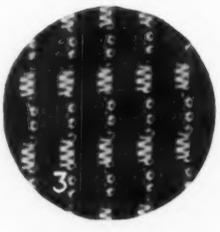
As can be seen from the above table, practically no change occurred in the breaking strength and elongation data but the excessive crepage was completely avoided, the new work factor being less than 50% of the excessive amount of the original yarn tested.

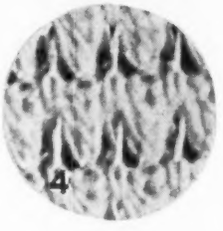
THE POLO SHIRT

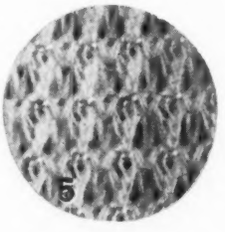
Now retailing for fall wear and promising greater success in 1936











The five shirts and fabrics (true size) of each bear corresponding numbers

DUE to the fact that more polo shirts were sold this year than in 1934, at least as many rayon polo shirts went over the counter this summer as last; but, looking at the matter on the basis of proportions, rayon lost ground to cotton. Rayon knitters say that this was due to the cool weather at the beginning of the summer season or that the cotton shirts, commonly made in openwork patterns, offered a novelty appeal which the longer-established rayon shirts lacked. Certainly the cotton shirts appeared in a greater variety of fancy stitches, largely because openwork in less-bulky rayon fabrics leads to lack of body and weight and to sleaziness. Also, the cotton shirts unquestionably offered greater warmth for the cool days and, in the perspiring dog days, they did not look so wet and did not cling so noticeably to the wearer.

For this fall, polo shirts are appearing in dark colors and with long sleeves. Now that vests are beginning to appear, some enterprising manufacturer may close the gaps just below the neck with buttons and permit the shirts to be worn with neckties. With a fused or chemical collar, the erstwhile polo shirt might be worn any time of year. The more the knitted shirt turns from sport to dress, the better chance rayon has to dominate it, because in knitted form rayon is noticeably sleeker, thinner, and hence dressier than cotton.

Most typical of the usual synthetic-fiber polo shirts are those numbered 1 and 2 among the accompanying illustrations. Knitted piqué is extensively used for undergarments, dresses, millinery, pajamas, neckties, mufflers, and so on; and it is natural that it should have been one of the first and foremost of polo-shirt fabrics. Shirts 1 and 2 are made of piqué knitted on spring-needle jersey machines of the individually-operated-needle type; but they differ in that 1 is of 150-denier acetate and is constructed three-knit-three-tuck, while 2 is of 150-denier viscose and knitted two-knit-two-tuck. No. 1 was finished wider than 2, with the result that the wales are flatter. Let us say right here that excessive stretching in finishing is something which may lose the consumer's respect for synthetic-fiber shirts.

Shirt numbered 3 was knitted of 150-denier yarn and on the same type of machine as 1 and 2, but in a float pattern, rather than in a tuck pattern. The needles are set three long-butt and three short-butt, every other feed knitting plain and alternate feeds floating over three needles, either long or short butt. Acetate is knitted on one plain feed and viscose on the remaining five, the blue dye leaving the acetate white. A more pronounced rib effect could be achieved by closing the floats more tightly. The collar on this shirt has a stiff filler.

Shirts 4 and 5 are predominantly cotton, but contain rayon. Both were knitted on latch needles, but No. 4 is a jersey and No. 5 a rib. The former is a poor construction, since all the tucks hang on one rayon stitch, stretching it and causing it to rob yarn from adjacent needles. If one of these rayon stitches should break, or should be skipped at the seam by the sewing needle, a disastrous run would follow. In the case of No. 5, which is a 1 × 1 rib knitted on six feeds, the single end of the bright rayon is the first of the three courses to tuck. The rayon in No. 4 is 300-denier; in No. 5, 150-denier.

The five shirts photographed show various types of neck opening.

STAPLE NO SUBSTITUTE...

In this country it must stand on its own merits

RECENT news reports, particularly from abroad, have established a wide-spread belief that staple rayon is about ready to supplant cotton and wool in this country. Although the belief is stronger outside the textile industry than in, there appears to be need for at least a brief exposition of the true situation.

Compared with Cotton

In this country and even in Germany, where perhaps the most noise is being made about it, staple rayon costs more than raw cotton. The fact that there is less waste of stock in converting staple rayon into yarn and that fewer processes are required in spinning and finishing it (no cleaning and bleaching are necessary) is not of sufficient importance to counteract this difference in cost. So long as staple rayon is priced at over 30c. a pound and cotton is priced at under 20c. a pound, spun-rayon yarn of low or medium counts will continue to cost at least 10c. a pound more than cotton yarn. In the case of combed, mercerized, long-staple cotton yarn, the difference will not be so great; because long-staple rayon is priced no higher than short-staple rayon and the yarn made from it requires to be neither combed nor mercerized. However, a combed, mercerized cotton yarn is so much superior in strength to a spun-rayon yarn that substitution would be difficult even if the two yarns were to cost the same. Because of these factors, staple cannot by any means be considered a substitute for cotton.

When the price of staple rayon falls below that of raw cotton, as will probably happen eventually, no doubt there will be extensive substitution—even if then, as now, staple rayon remains inferior to cotton for most of the uses to which cotton is put. We base this assumption on the fact that filament rayon, cheaper than filament silk, has replaced the latter for many uses to which silk is better adapted. But staple rayon shows no immediate prospect of dropping so low in price. It still costs too much to produce it.

Compared with Wool

Although staple rayon is already cheaper than clean wool (by well over 20c. a pound) it possesses few of the basic properties of wool and hence, for that reason alone, cannot properly be considered a substitute. Wool has a natural springiness which gives yarns and fabrics made from it a permanent lightness, resistance to heat permeation, and resistance to creasing obtainable through the use of no other fiber; and furthermore it has the unique property of felting when subjected to the requisite amounts of pressure, heat, and moisture. Spun rayon has neither of these properties, and its yarns are likely to be dense and heavy when compared with wool yarns of the same diameter. (It should be understood that acetate staple is superior to the viscose type in heat- and electrical-insulating properties.)

Now, of course, many fibers are being used as substitutes for wool, including cotton and the other vegetable fibers. Usually the wool-like fabrics containing them contain also wool, either blended or as complete yarns. Staple rayon is being so used, but it can hardly be considered as responsible for the trend toward the reduction of wool content in fabrics. That is an old trend and was well on its way before staple rayon made its appearance. Therefore, so far as the wool industry is concerned, staple rayon can be considered no more than a substitute for substitutes. It has been found distinctly preferable to certain substitutes for many purposes, however, as it can, when blended with wool, impart a brightness to the fabric which is often desirable. Furthermore, it is softer than some of the other substitutes. Nowhere has wool been more extensively supplanted than in the summer-suiting field, and some promising fabrics for this purpose have been developed entirely of spun rayon.

Since it appears that staple rayon stands little chance as a direct substitute for cotton or wool, it is evident that, if it is to carve a niche for itself, it must show qualifications which make it a desirable raw material on its own account. What has it to offer?

Advantages of Staple

First, it has softness and good draping quality. These related properties are due to the following five exceedingly important factors:

1. Rayon fiber is more flexible than natural fibers, due to the inferior orientation of the micellae (groups of molecules) which compose it. While this inferiority is detrimental to strength and elasticity, it does contribute to unique properties of softness and drape.

2. Rayon-staple fibers are fine. For use in all-rayon yarns, which are usually spun on the cotton system, they are commonly 1.5 denier, which approximates the denier of a single silk filament. Hence the rayon is finer than American cotton and considerably finer than the average wool. For mixtures with wool a 5½-denier rayon is commonly used; but in considering the potentialities of rayon staple and its ability to stand on its own feet, we are not primarily concerned with mixtures.

3. The fiber is smooth and straight. It does not have the spirality of cotton, nor the scales and curl of wool. Hence it has a slipperiness which affords drape while sacrificing some spinnability, yarn strength, and yarn elasticity. Curl is sometimes imparted to rayon staple in the raw state but, so far as is generally known, little or no success has been achieved in making the effect permanent.

4. The rayon fiber can be, and usually is, supplied in long lengths. For spinning alone, usually accomplished by cotton methods, the common length is 1½ in. (For worsted mixtures the range is 4 to 7 in., and for woolen

Men's summer suiting shown as background for heading is entirely of staple rayon.

mixtures any length desired is supplied.) The 1½-in. staple permits the use of lower, softer twists than would be possible with shorter staple. In fact, twisting rayon as tightly as cotton is usually twisted carries the rayon yarn beyond its point of maximum strength—a circumstance which renders low twists imperative.

5. The rayon staple is remarkably uniform in length. This fact makes it unnecessary to establish a factor of safety by inserting extra twist to allow for fibers which are shorter than the average. It also contributes to yarn uniformity, as we shall point out later.

Second, staple rayon has luster—and a luster which is peculiar to itself. Being spun, its brightness is softer than that of bright rayon, because its fibers are intertwined, and do not reflect light so continuously; but, being basically like rayon, it is brighter than normal cotton or wool and its yarns often have a mercerized appearance. In some cases, however, particularly for use in wool-like fabrics, it is supplied in low luster.

Third, staple rayon has uniformity. Its relatively constant staple diameter and length insure the spinning of even yarns and yarns of comparable size, twist, and appearance. The constant dimensions of staple, combined with the relatively constant basic composition of the fiber and the absence of such variations as are caused in cotton by differences in maturity, etc., insure relatively uniform dyeing and finishing properties. It should be pointed out, however, that spun-rayon fabrics, being delicate and easily damaged in the wet state, have to be handled with special care in the finishing.

Spun rayon's principal disadvantage is its deficiency in strength, particularly wet strength; but when compared with a cotton yarn of shorter staple (and such a comparison is perfectly proper, since long-staple rayon is adequately available and at no greater price than short-staple) spun-rayon yarn in the dry state is not greatly behind cotton yarn. Courtaulds, Ltd., for example, operating under optimum conditions, has spun 1½-in. staple to a strength fairly comparable to that of ordinary 1-in. cotton yarn (TEXTILE WORLD, Feb. 14, 1935, page 64). Another disadvantage, far more important in some fabrics than in others, is the deadness and tameness of the fiber, which leads to lifeless and dense yarn, resulting in poor warmth retention and ready creasing.

Those who plan to promote or use spun-rayon yarns will therefore do well to study and develop fabrics in which one or more of these three advantages are of importance and the disadvantages of unimportance.

Staple rayon enjoyed its greatest triumph some two years ago in the Roshanara type of crepe. Here was a fabric in which a soft feel and soft luster were desired. Although uniformity was not so essential, its existence was beneficial. More recently spun rayon was used effectively in moss crepe for the same reasons. Now it is being employed to a considerable extent in flat crepes. Its properties have been used effectively in knitted outerwear and certain types of upholstery.

Uses are being found for staple rayon, as Mr. Mattmann's article in this issue clearly testifies; but its price will have to be reduced and strength, springiness, and spinnability increased before it can become a major textile fiber. We do not say that that will not happen.

STANDARDS ACCELERATE . . .

Rayon tests and specifications progressing rapidly

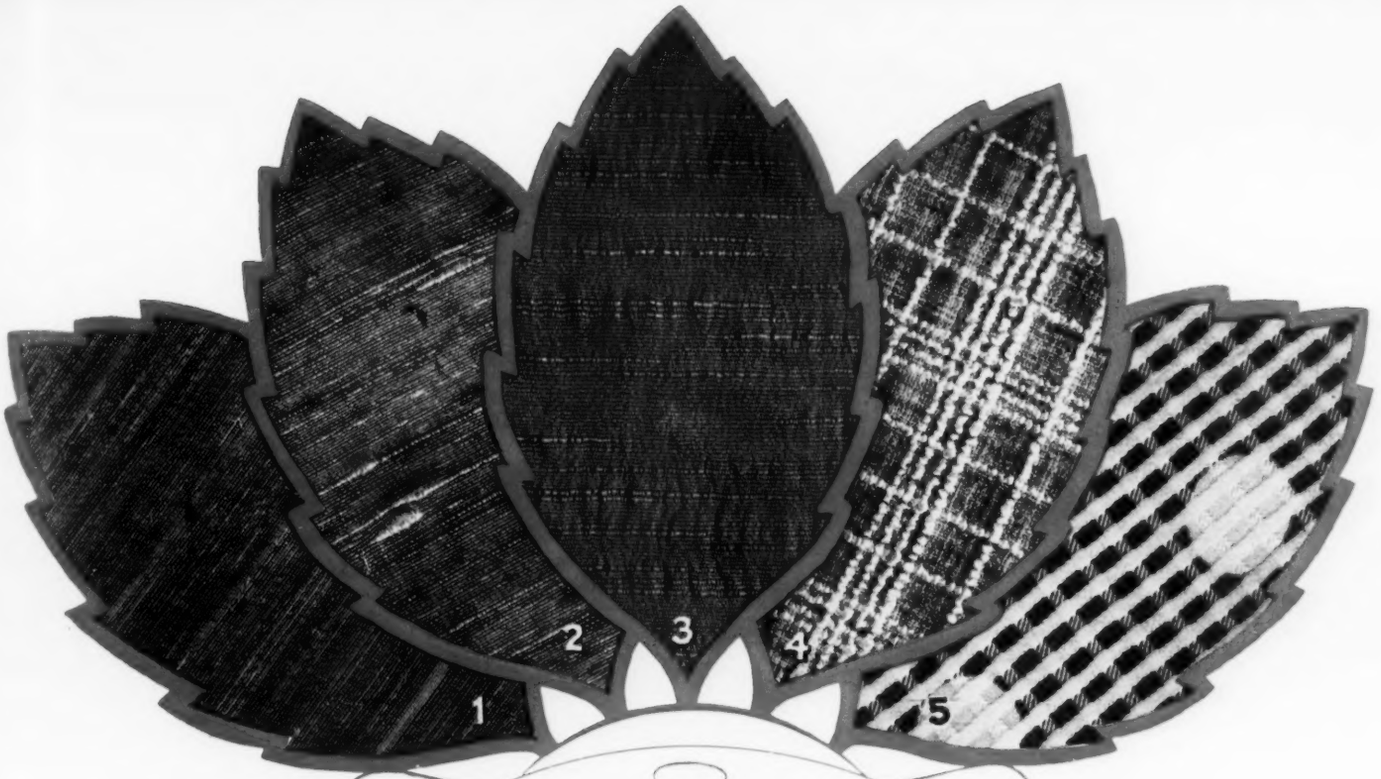
IT IS an encouraging thing for the future of the synthetics industry—which is relatively new and still struggling for complete consumer acceptance—that standards which offer due recognition and reward to quality are now coming forward by leaps and bounds. In June a movement which was started one and a half years ago by the General Federation of Women's Clubs and which was later taken up and carried on by the National Retail Dry Goods Association and the Consumers' Advisory Board of NRA culminated in an important conference in Washington.

At that time the development of methods of testing, recording, and rating rayon and silk dress fabrics was reported by the U. S. Testing Co., Better Fabrics Testing Bureau, and Hatch & Reutlinger, which had developed their recommendations with the cooperation of the National Bureau of Standards. Included were test methods for breaking strength; color fastness to crocking, dry-cleaning, dry-pressing, laundering, light, and perspiration; dry-cleaning ability; launderability; steaming; shrinkage; and slippage. In the near future the Trade Standards Division of the Bureau will arrange for one of its famous general conferences of manufacturers, distributors, and users in order that the proposed standards (and probably others on cotton, wool, and linen dress goods) may be duly accepted and promulgated.

While this standardization work relative to finished fabrics is going on, an effort to establish standards on the quality of gray goods is being made by the National Rayon Weavers Association in collaboration with the Greyco Sales Corp., both of which organizations represent influential groups of mills. Primarily these standards will deal with fabric constructions; and the first stage of the undertaking, already under way, is one of insuring that yarns are employed which are entirely suited to the fabrics to be made.

In addition to these undertakings, Committee D-13, the textile committee of the American Society for Testing Materials, has, of course, been busy with important rayon matters during the year. New tests have been established for the identification of types of synthetics and for the determination of synthetic content in textiles. A satisfactory method for determining shrinkage in the laundering of silk and rayon woven broad goods, although it does not include shrinkage according to household practices, is a real achievement. A new test method employs an autographic tensile-strength testing machine with a standard seam to determine the slippage resistance of silk and rayon woven goods. Another new test determines the strength of rayon woven fabrics when wet. Work is under way on a test for fastness to laundering and domestic washing of dyed or printed silks and rayons, and for fastness to light of such materials.

Certain other D-13 undertakings, while not directed primarily to the rayon field, nevertheless concern it in common with other branches of the industry. For example, specifications for the elongation test on woven fabrics call for an initial load of 6 oz. (or other weight as specified) to be applied to the sample before it is clamped in the lower jaw of the tensile strength tester.



SPRING IS COMING!

And with it shantungs, cloqués, openworks, and other "exotic" fabrics

By Carl C. Mattmann, Jr.

THERE is an echo of history—and almost a note of pathos—in a consideration of one of the fabric vogues destined for next spring and summer. The silk-cultivation industry, from the time of its inception to the present day, has struggled persistently to overcome the natural irregularities which were so common in the wild silks of the earliest days. Although a high measure of success has been achieved (the opinions of certain sheer-hosiery manufacturers notwithstanding), it took the advent of the synthetics to bring the goal of uniformity in continuous-filament yarns definitely into view. But now, exactly as the lumber industry takes pleasure in mocking the early pioneers by producing "hand-hewn" beams and clapboards, so the synthetics industry proposes to mock the hard-struggling generations of silkworm raisers by giving special attention to imitating the irregularities of wild silk.

The silk men can hardly complain of this idea, because it is an old trick which they have used and are using themselves—as the numerous pongees, shantungs, tussahs, and doupions testify. It is not a new trick to the rayon men either, but the fact that the shantung type of fabric was confined to the high-priced garments in the season just closed is one important piece of evidence that it will be given emphasis next year. Whenever a fabric goes volume, its vogue is just about over—unless it has some unusual appeal.

And a fabric which has such *(Continued on page 112)*

Constructions of illustrated fabrics—All finished 38½" in width.

1. **Shantung.** Warp: 42" in reed, 150 ends, 75-den. 5-turn semi-dull rayon, 50/3/1 reed. Filling: 54 picks, 18/1 novelty spun-silk base with fast-resist dyed black and red hairs. Weave: plain. Rayon and spun-silk base dyed gold.

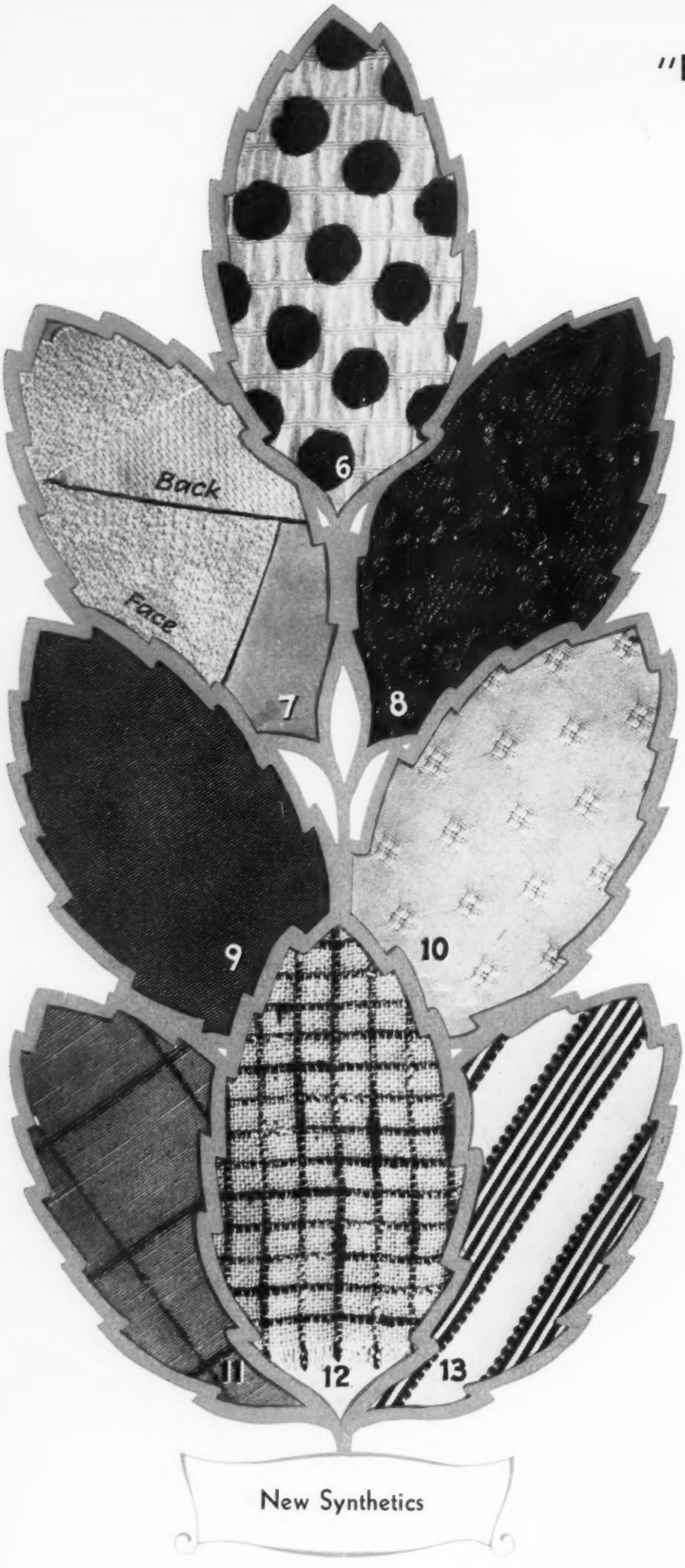
2. **Shantung.** Warp: 42" in reed, 120 ends, 120-den. 4-turn dull acetate, 40/3/1 reed. Filling: 56 picks, 20/1 novelty irregular yarn-dyed spun-silk with fast-resist black, yellow, and red slubs. Weave: plain. No dyeing—just boil off and finish for soft dress hand.

3. **Exotic Shantung.** Warp: 46" in reed, 135 ends of 100-den. 54-turn dull acetate, 45/3/1 reed. Filling: 44 picks, 250-den. average irregularly pulsated slub rayon crepe, about 40 turns, 2S and 2Z. Weave: plain. Solid dyeing, soft hand.

4. **Shantung-Theme Cross Plaid.** Warp: 44" in reed, 54 ends, 2 beams, first beam holding 2-ply long-staple spun-rayon ratiné of about 4,000-yd. number, second beam holding 2-ply consisting of 20/1 long-staple spun rayon and 2 ends of 1/100 slit acetate spiraled around it, 18/3/1 and 1/1 reed. Filling: 44 picks, same yarns as warp. Warp layout: 18 ends of spiral, 1 ratiné, 18 spiral, 1 ratiné, 18 spiral, 1 ratiné, 18 spiral, 1 ratiné, 3 spiral, 1 ratiné, 3 spiral, 1 ratiné, 3 spiral, 1 ratiné = 88 ends in 1 repeat, of which 81 are spiral and 7 ratiné. Filling layout: 17 picks of spiral, 1 ratiné, 17 spiral, 1 ratiné, 17 spiral, 1 ratiné, 17 spiral, 1 ratiné, 3 spiral, 1 ratiné, 3 spiral, 1 ratiné, 3 spiral, 1 ratiné = 84 picks in 1 repeat, of which 77 are spiral and 7 are ratiné. Weave: cross plaid effect. Only slit acetate dyed black, leaving spun rayon white.

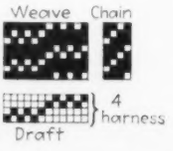
5. **Satin Stripe with Discharge Print.** Warp: 46" in reed, 150 ends, 2 beams, 90 ends and 60 ends, laid 18 ends of 100-den. 4-turn dull acetate and 12 ends of 100-den. 5-turn bright rayon, 35/6/1 and 3/1 reed. Filling: 80 picks shot 8 picks of 100-den. dull acetate and 12 picks of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z. Weaves: acetate stripe, 5-shaft satin; rayon stripe, plain. Rayon dyed brown, leaving acetate white, followed by coin discharge print of white. *(Continued on page 110.)*

"EXOTICS" for SPRING



6. Drawn Taffeta. Warp: 42" in reed, 200 ends, 75-den. 4-turn bright acetate, 50/4/1 reed. Filling: 58 picks shot 20 picks of 120-den. 2½-turn dull acetate and 2 picks of Lastex. Weave: plain. Red application print.

7. Exotic Summer and Cruise Type. Warp: 43" in reed, 168 ends, 100-den. 4-turn dull acetate, 42/4/1 reed. Filling: 40 picks, 3-end ratiné of about 10,000-yd. number and consisting of 2 ends bright rayon and 1 end dull acetate.



8. Open-Work Jacquard. Warp: 48" in reed, 192 ends of 100-den. 5-turn dull cuprammonium, 48/4/1 reed. Filling: 76 picks, 75-den. cuprammonium crepe, 65 turns, 2S and 2Z. Weave: jacquard on 600 machine, 576 hooks.

9. Cross-Tone Taffeta. Warp 42½" in reed, 200 ends, 75-den. 4-turn bright acetate, 50/4/1 reed. Filling: 64 picks, 120-den. 2½-turn bright rayon. Weave: plain. Rayon dyed gold, leaving acetate white for two-tone frosted effect.

10. Open-Work Effect. Warp: 40½" in reed, 80 ends, 150-den. 5-turn dull cuprammonium 40/2/1 reed. Filling: 64 picks, 180-den. ½-turn soft-twist dull cuprammonium.

11. Shantung One-Inch Check. Warp: 43" in reed, 120 ends, 2 beams, 100-den. 5-turn bright-rayon ground, 1-end of 4-run silk noil stripe with black yarn-dyed slubs, 40/3/1 reed. Filling: 48 picks, 6-run silk noil with white slubs for ground, 2 picks of 4-run silk noil with black yarn-dyed slubs for cross stripe. Boiled off and finished only.

12. Shantung Spiral Check, Exotic Theme. Warp: 43" in reed, 28 ends per inch, laid 7 ends of 3-end spun-rayon spiral of about 7,000-yd. number and 1 end of 3-end bouclé of about 4,000-yd. number consisting of 2 ends of wool and 1 end of spun rayon, 14/2/1 and 1/1 reed. Filling: 28 picks shot 6 picks of 3-end spun rayon as in warp and 1 pick of 3-end bouclé as in warp. Weave: plain. Wool dyed navy, and spun rayon dyed gray.

13. Pekin Stripe. Warp: 48" in reed, 135 ends, 2 beams, 100-den. 4-turn dull white acetate, 100-den. 4-turn black-spun acetate, 100-den. 5-turn yarn-dyed fast red rayon for pekin stripe, 45/3/1 reed. Filling: 68 picks, 100-den. rayon crepe, 50/55 turns, laid 2S and 2Z. Warp layout: 48 ends of white, 3 red, 1 white, 3 red, 1 white, 3 red, 1 white, 6 black, 6 white, 6 black, 6 white, 6 black, 6 white, 6 black, 6 white, 6 black, 3 red, 1 white, 3 red, 1 white, 3 red, 1 white = 126 ends in 1 repeat, of which 78 are dull white acetate, 18 are red fast-dye rayon, and 30 are black-spun acetate.

14. Open-Work. Warp: 45" in reed, 78 ends, 2 beams, 52 ends and 26 ends, laid 4 ends of 200-den. 4-turn dull acetate and 2 ends of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z, 39/2/1 reed. Filling: 72 picks, shot 4 picks of 200-den. 2½-turn dull acetate and 2 picks of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z.

15. Exotic Check Canton. Warp: 48" in reed, 120 ends, 120-den. 5-turn dull rayon, also a gold lametta yarn, 40/3/1 reed. Filling: 48 picks, shot 32 picks of 200-den. rayon crepe (45/50 turns) 2S and 2Z and 1 pick of 4-end bouclé slub of about 4,000-yd.

"EXOTICS" for SPRING

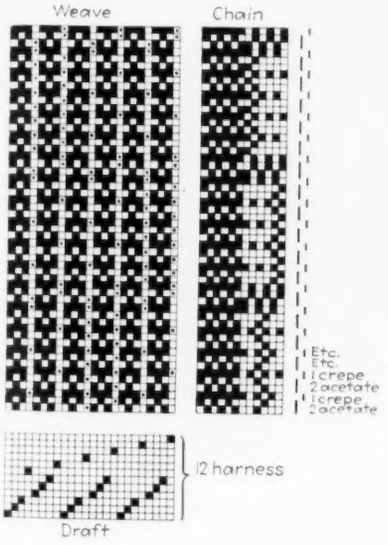
number and consisting of 2-thread cotton core, 1 end of bright acetate binder, and 1 end of bright acetate wrap-around.

16. Exotic Romaine. Warp: 52" in reed, 238 ends, 100-den. 4-turn dull acetate, 34/7/1 reed. Filling: 80 picks, 8-thread 20/22 45-turn Japan crepe 2S and 2Z. Weave: fancy romaine.

17. Shantung Moss. Warp: 48" in reed, 56 ends, ondé yarn consisting of 120-den. dull acetate plied 12 turns with 100-den. rayon crepe, laid 2S and 2Z, 28/2/1 reed. Filling: 52 picks, ondé yarn consisting of 250-den. random-pulsated slub rayon plied 10 turns with 100-den. rayon crepe, 50/55 turns, 2S and 2Z.

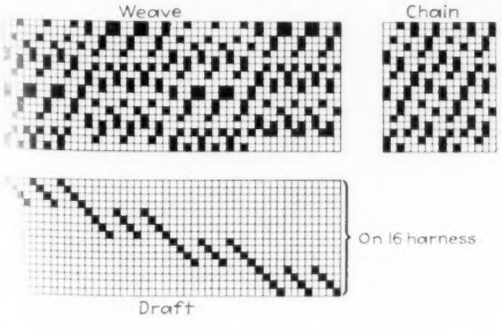
18. Satin-Back Hairy Type. Warp: 46" in reed, 280 ends, 75-den. 4-turn bright acetate, 35/8/1 reed. Filling: 56 picks, shot pick and pick, of 10/1 fancy spun-rayon soleil hair yarn and 100-den. 50/55-turn rayon crepe Z-twist only.

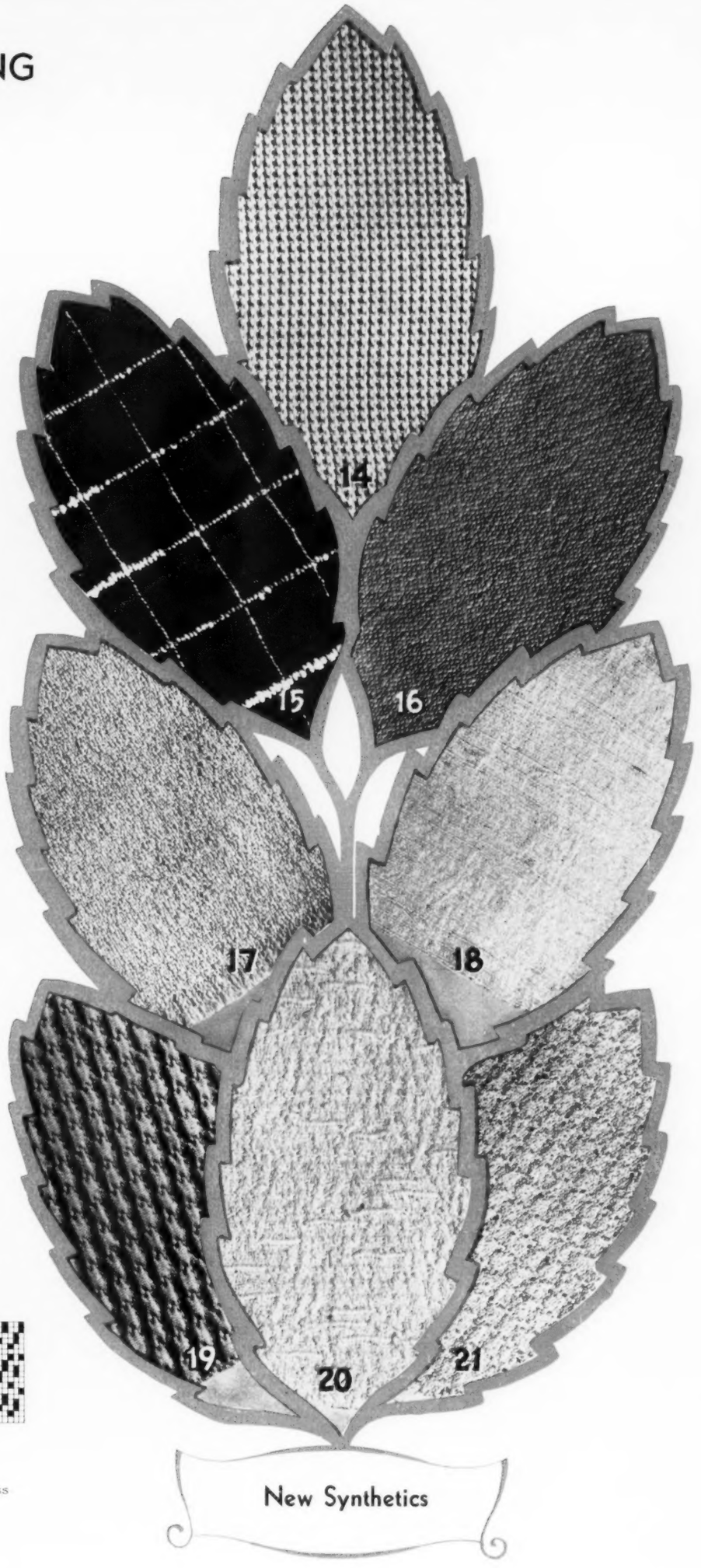
19. Bubble Matelassé. Warp: 50" in reed, 312 ends, 2 beams, 3 ends of 100-den. 4-turn dull acetate, 1 end of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z, 28/4/1 reed. Filling: 88 picks, shot 2 picks of 100-den. 2½-turn dull acetate and 1 pick of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z.

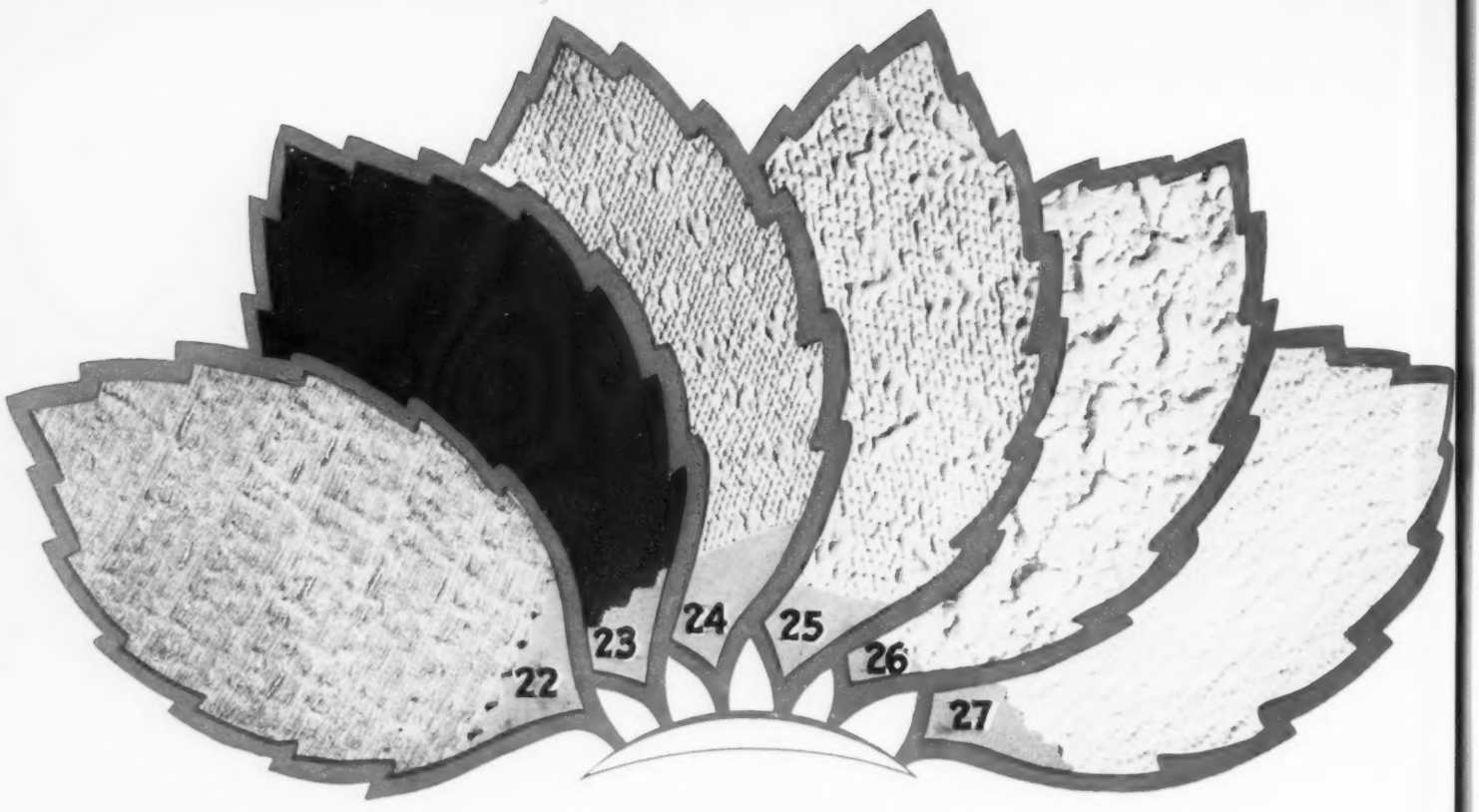


20. Satin-Back Slub Canton. Warp: 48" in reed, 135 ends, 100-den. 5-turn rayon, 45/3/1 reed. Filling: 52 picks shot 2 picks of novelty slub rayon crepe Z-twist and 4 picks of 150-den. 50/52-turn rayon crepe S-twist.

21. Exotic All-Over Theme. Warp: 48" in reed, 135 ends, 100-den. 4-turn dull acetate, 45/3/1 reed. Filling: 92 picks, pick and pick, of 4-thread 13/15 Japan crepe 65-turns shot 2S and 2Z and a cuprammonium-and-silk ratiné of about 11,000-yd. number.

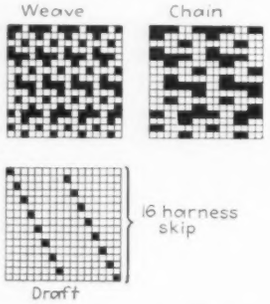






22. Satin-Back Novelty. Warp: 48" in reed; 280 ends, 75-den. 4-turn bright acetate, 35/8/1 reed. Filling: 80 picks in following layout:

8 picks 100-den. rayon crepe 2S, 2Z
1 pick 6,300-yd. cotton-rayon nub
Repeat above 3 times
2 picks 100-den. rayon crepe 2S
1 pick 7,000-yd. rayon ratiné
2 picks 100-den. rayon crepe 2Z
1 pick 7,000-yd. rayon ratiné
2 picks 100-den. rayon crepe 2S
1 pick 6,300-yd. cotton-rayon nub.
Repeat all once, reversing direction of twist.



23. Entwining-Weave Novelty. Warp: 48" in reed, 160 ends, 2 beams, 3 ends of 100-den. 4-turn dull acetate, 1 end of 100-den. 50/55-turn rayon crepe laid 2S and 2Z, 40/4/1 reed. Filling: 60 picks, 100-den. 50/55-turn rayon crepe, 2S and 2Z.

24. Small Spaced Matelassé. Warp: 46" in reed, 150 ends, 2 beams, 2 ends of 100-den. 4-turn dull acetate, 1 end of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z, 50/3/1 reed. Filling: 64 picks, shot 2 picks of 200-den. 2½-turn dull acetate and 2 picks of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z.

25. Spaced Matelassé. Warp: 48" in reed, 165 ends, 2 beams, 4 ends of 100-den. 4-turn dull acetate, 1 end of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z, 33/5/1 reed. Filling: 64 picks, shot 4 picks of 200-den. 2½-turn dull acetate, and 2 picks of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z.

26. All-Over Matelassé Sheer. Warp: 48" in reed, 115 ends, 2 beams, 4 ends of 100-den. 4-turn dull acetate, 1 end of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z, 23/5/1 reed. Filling: 68 picks, shot 4 picks of 200-den. 2½-turn dull acetate and 2 picks of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z.

27. Relief-Weave Matelassé. Warp: 50" in reed, 112 ends, 2 beams, 3 ends of 100-den. 4-turn dull acetate, 1 end of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z, 28/4/1 reed. Filling: 64 picks, shot 2 picks of 200-den. 2½-turn dull acetate and 2 picks of 100-den. 50/55-turn rayon crepe, the latter laid 2S and 2Z.

(Continued from page 109) an appeal, is the matelassé. Since this fabric experienced its first season in its modern form a few years ago, its demise has been frequently predicted. In fact, in the fall of 1933 such a prediction seemed to be becoming speedily fulfilled. But in 1934, with a surprising show of vitality, the stuffed-effect idea sprang back to life, although in a more conservative form—that is, with fewer large figures or "effects." (Originally these effects frequently ran several inches in length.)

There is a remarkable beauty to the matelassé weave, and its versatility permits such a variety of constructions and effects that predictions for its demise are becoming hesitant and infrequent and it appears certain that it will be the theme of many a fabric for the 1936 seasons. Perhaps the fact that there is a tendency to replace the term "matelassé" with the term "cloqué" will help to maintain some degree of freshness in this interesting vogue. As the matelassé or cloqué is the most "exotic" of all the so-called "exotic" weaves, it may remain of importance until the eventual return to dominance of the plainer, smoother fabrics. You guess when that will be.

There are other fabrics for next spring and summer which require attention. Openwork weaves, some boasting an embroidered effect, will be in demand. The pekin stripe—of satin or of merely long parallel warp floats bound in at intervals—will probably decorate many fabrics. This may also be true of hairlines. A moderate amount of metal will be found in 1936 fabrics. The same cannot be said with a degree of assurance for the slit cellulose film, except in the case of the new metallized film. Scratchy materials, including metals, must be used where they can be well protected by soft yarns, especially on the backs of fabrics.

There is a question as to the immediate future of taffetas; but at least the "shot" type—with two colors in the filling for "iridescent" effects—or the drawn type—with an occasional two picks of crepe or Lastex—will receive some attention. Satins may also be drawn up or gathered in this manner. As usual, the prints on chiffon, crepe-de-chine, and satin will be extensive in variety and volume.

ADVERTISING PAGES REMOVED

When the goods came back the manufacturer learned the

Value of pH Control

By Frederick R. Harrison

A CERTAIN reputable and careful manufacturer of bathing suits recently took it upon himself to scour some of his worsted suits before sending them to market. This scouring operation was simply in the interest of cleanliness—an extra process to insure a product free from any slight dirt or stains which might have been picked up during knitting, cutting, sewing, and other processes. The suits, which were made with colored trunks, bleached white tops, and colored decorations, were then packed in individual boxes for shipping. Some months later, when the boxes were unpacked in retail stores, there emanated a decidedly disagreeable odor characteristic of rancid fatty matter.

The manufacturer took back the goods and immediately started an investigation. Fortunately no irreparable damage was done and the manufacturer was able to eliminate the odor. However, if he had employed some system of pH control in his wet finishing operations, he would have avoided both the embarrassment of having the suits returned and the extra expense incurred in reprocessing.

There are various methods and types of apparatus which are suitable for making pH measurements. The average knitting mill or other small textile plant will find that a portable comparator of the colorimetric capillary type is convenient, economical, and sufficiently accurate for most control work. The device is so compact that it can be carried about in the pocket for making tests in any part of the plant. The technique of making a pH test with this apparatus is simple and requires no special experience or training.

Although samples of yarn or fabrics weighing less than 1 gram can be used in the test, usual practice is to take a larger sample. The following method is in common use and is quite adequate for most textile purposes, other than research: A 10-gram sample of the cloth is wet out in a beaker containing 100 c.c. of neutral (pH 7) distilled water and allowed to soak for 1 hour at room temperature. At the end of that time, the pH of the cloth and water should be in equilibrium, and a measure of the acidity or alkalinity of the water would represent the pH of the sample. The same ratio of material to water (1 to 10) is used with yarn, tops, loose fiber, etc.

The comparator consists essentially of a series of 3x4½-in. standard cards on which are mounted five capillary tubes filled with colored solutions of predetermined pH. Each card covers in steps of 0.2 pH the entire color range (about 1.6 pH units) of its respective indicator. With each card is included a small bottle of indicator solution, a capillary tube with rubber bulb (such as is found on eyedroppers), and several 1-in. watch glasses. The capillary tubes, which are carried in a small glass container, are 4 in. long and $\frac{1}{16}$ in. in diameter.

The capillary tube first is filled to the mark with one of the indicator solutions, which is then squeezed out into a watch glass. The same tube is used next to put a similar amount of the solution to be tested into the watch glass, where the two small portions are thoroughly mixed, using the end of the capillary tube as a stirring rod. The tube is then carefully dried off and filled with the mixture of unknown solution and indicator, after which it is compared with the standards. When the color in the capillary tube exactly matches that in a standard tube, the pH measurement is read directly from the card. In event the colors do not match, the procedure is repeated with the next card and indicator until a match is secured. Incidentally, each card overlaps the next in the series, which permits check tests with two indicators to give a double assurance of accuracy. There is available a universal indicator for determining pH quickly within approximately 1 pH unit. Some of the indicators which are particularly useful in the textile mill are shown in the accompanying table.

When the bathing suit manufacturer mentioned above called upon a chemist to help in the investigation of the problem, it was found that the colored yarn had been dyed in the usual manner in an acid bath. However, in addition to employing a normal percentage of acetic acid in the operation, the dyer had given the goods a final treatment with 4% sulphuric acid to insure maximum fastness to fresh and salt water. Tests showed that the goods were on the acid side, ranging from pH 2.5 to pH 3.2. Obviously, the ordinary rinse after dyeing did not remove all of the residual sulphuric acid from the goods. This acid, while it was not detrimental to the wool, broke down the soap deposited on the fibers during the subsequent scour and released free fatty acids. These fatty acids became rancid while the goods were inclosed in the packing boxes.

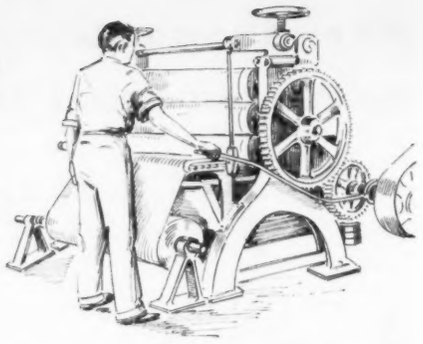
To prevent recurrence of the trouble, it was recommended that one of the new detergents which are resistant to acids be employed for scouring any material which contains residual acid. Incidentally, the smelly bathing suits were scoured with one of these compounds and restored to the status of first-class goods.

The case cited is only one of many in which pH control is important in textile processing. The more progressive mills are already making extensive use of this comparatively new "yardstick." Every mill technician concerned with wet operations should familiarize himself with the fundamentals of pH control. Once he understands the language and is able to translate pH measurements into practical terms for his own guidance, he will find that control of pH is almost as simple and equally important as control of temperature and pressure.

Indicators commonly used in making pH measurements

Indicator	pH range	Color range
Universal—for rough preliminary tests	4.0–11.0	Orange-red through yellow, green, and blue, to violet.
Bromo Phenol Blue	2.8–4.6	Yellow through gray to violet.
Bromo Cresol Green	3.6–5.2	Yellow through green to blue
Bromo Cresol Purple	5.2–6.8	Yellow through gray to violet.
Bromo Thymol Blue	5.9–7.7	Yellow through green to blue.
Phenol Red	6.8–8.4	Orange to red.
Thymol Blue	8.0–9.6	Yellow through green to blue.

Pad Dyeing Faults



Prevention of water spots, crease marks, and other defects.

By Francis A. Newton

AS A RULE, less difficulty is encountered in the operation of padders than in that of other types of dyeing equipment. When trouble does occur, however, it is likely to be serious, as the padder turns out work at a relatively high rate of speed and a large amount of cloth may be damaged before the fault is noticed. For these reasons, it is essential that the machine be kept in first-class mechanical condition at all times and that the foreman and operator be on the alert constantly. Particularly is this true when vat colors or other fast dyes are being applied on the padder. Direct colors usually can be stripped, and the fault remedied by redyeing; but defective goods dyed with fast colors ordinarily cannot be salvaged in this way and must be seconded or put into dark shades.

The condition of the nips rolls is of utmost importance, any irregularity in these rolls being almost certain to result in a repeat mark or other defect. A daily inspection of these rolls will, therefore, do much toward preventing bad work. If a wooden roll is used as the top bowl in a three-bowl mangle, it should be as free as possible from knots, mixed grain, or grooves due to improper adjustment of the lathe used in turning it down. Mal-adjustment of the top bowl in the pad must be avoided, or "measly" dyeings may result. This defect occurs if one end of the bowl is higher than the other, thus allowing a surplus of the dye liquor to go through the nip. When the goods reach the dry cans, the surplus liquor "boils" and, before it dries, is distributed as measly spots on the surface of the cloth. Listing is another fault which can be traced to uneven adjustment of the top bowl. If either of these defects occurs with any great frequency, it probably will prove advisable to fit the padder with a central adjustment, in place of the usual side weights.

Water Spots Troublesome

Water spots are often troublesome, especially on long runs, when the padder and drying cans are operated in range. Evaporation over the drying cylinders is so rapid that condensation takes place with consequent water drops on the material passing over the cylinders. On direct dyeings water spots will show up immediately; on naphthols and many of the Indigosols, not until the goods have been developed and it is too late to remedy the matter. Danger from water drops can be minimized by inclosing the cans, providing a suitable louvre directly above the set, and installing one or more fans to carry away the vapor.

On one occasion the writer investigated the cause of water spots on a naphthol-dyed fabric. The case was unusual in that the damage took the form of a number of spots right across the piece at fairly regular intervals. In shape the spots were elongated, in size they varied from large drops at one side to much smaller ones on the other, with a fairly regular gradation in size. The fault evidently was not at the drying cylinders, as drops from this source are usually irregularly spread over the surface of the cloth. On going into the matter, it was discovered that the goods had been padded on an isolated mangle and batched up before drying. The mangle in question had a spray pipe situated immediately above the top bowl. This pipe was leaking, and was giving rise to all the trouble. The spots showed the elongated shape because of the speed at which the mangle was running, thus causing spreading as the drop touched the swiftly moving cloth.

Certain of the dyeing assistants employed as wetting and dispersing agents cause frothing of the bath, and in some instances this frothing is so pronounced as to obscure the surface of the liquor completely and make it impossible for one to see whether or not it is being maintained at a constant level in the mangle box. In such cases it is a good plan to bore a hole in the side of the mangle box at a suitable level and insert a glass U-tube by means of a cork. The height of the liquor in the U-tube will indicate the level of the liquor in the box, and, by observing this, the operator can regulate the feed-in valve to give a constant flow.

Creasing Prevented

In order to prevent creasing of the cloth in padding it is the rule to use some form of a spreader to bring the goods out to width just before they go on to the drying cylinders. In almost every case this is satisfactory, but in isolated instances it is not. At one time we were drying a poplin which had been padded through a naphthol solution. No matter how the cloth was stretched or spread out after mangling, creasing persisted. Where the creases occurred, light places showed in the development. Finally we decided to run the goods onto the cans without use of spreaders, merely guiding the selvages by hand without tension. The creasing stopped. As a result of this experience, we installed an automatic selvage guider in front of the drying cylinders for use on all poplins and similar fabrics.

The patchy appearance of undeveloped Indigosols is a fault which is more alarming than dangerous, except in extreme cases. These streaks and patches appear as soon as the cloth is dried over the cylinders after it has been padded with the solution of the Indigosol and sodium nitrite. An investigation will usually disclose that the cloth has not been washed off properly after bleaching and scouring. As a result, the acid left in the material slowly decomposes the nitrite in the localized patches. As a rule, the amount of acid present is not sufficient to cause complete decomposition, and on final development the shades are level and show no signs of these irregularities. Formation of the patches is a danger signal, however, and—as is true of all danger signals in the pad dyehouse—should be taken heed of at once if serious trouble is to be avoided.

True By-Product Power

What it is, how it is obtained, how to calculate its cost

By H. E. Corl
Consulting Engineer, Philadelphia

TRUE by-product power may be defined as power obtained as a by-product in the generation of process steam to which may be charged only the heat drop through the prime mover. When all exhaust steam is used in process work and feed-water heating and no heat is discharged in condenser circulating water, the heat chargeable to power amounts to approximately 4,400 B.t.u. per kw.-hr. and, at 70% boiler efficiency, to 0.45 lb. of coal per kw.-hr. In plants where the process steam load is large compared to the electric power load, there is little difficulty in operating so that the power generated is true by-product power. On the other hand, plants having a heavy electric power load compared to the process steam load may be compelled at times to waste some exhaust steam, especially during the summer months when the heating load is missing. When this condition occurs, the cost of power generated rises in proportion to the steam wasted. It is evident that in such plants every possible use of exhaust steam should be made. The weight of exhaust steam escaping to waste must be charged to power at the cost of the live steam from the boilers minus the heat drop through the prime mover.

In textile plants large quantities of exhaust steam at about 5 lb. pressure are used for heating dyehouse and scouring-room water, low-temperature drying, starching machines, steaming machines, and building heating. The power-load demand will follow fairly well all of the above exhaust-steam demands, except building heating, which is, in most plants, a large and variable load totally independent of the power load. The percentages which can be used in calculating the distribution of the total yearly heating load over the heating months are shown in the accompanying table.

Plants generating power with engines expand the steam down to an average of 5 lb. back pressure, and the exhaust steam at this pressure is suitable for purposes named above. These plants usually operate with a boiler pressure of from 150 to 200 lb. gage. The more modern plants are using steam turbines of the extraction type, and in some cases a combination of steam engines and turbines. These plants have a wider range of supply to process steam, as they can supply bled steam from the turbines at 50 to 75 lb. gage pressure for high-temperature drying, dyeing, scouring, etc., as well as the 5-lb. exhaust.

Within the last few years a third method of generating by-product power has come into practice. A plant in need of more steam and electric power installs a high-pressure "top" on the present system. With this system steam is generated at higher pressures, usually 400-lb. gage, and is fed to a high-back-pressure turbine exhausting into the present boiler pressure mains at 150 to 200 lb. The difference between the amount of steam going to the turbine and the total boiler output is carried to the 150-lb. system through a reducing valve and desuperheater set. The electric power made by this turbine is true by-product power. In some cases where turbines are used, it has been found possible to operate the extraction turbines condensing and use all of the warm condenser circulating water in process, which disposes of all of the exhaust steam at all loads.

To arrive at the exact cost of by-product power it is necessary to consider the following factors: (1) fixed charges on the generating equipment, (2) engine room supplies, (3) labor required in the engine room, (4) repairs to the generating equipment, and (5) fuel to make the heat chargeable to power. As an example, assume a plant which generates 1,200,000 kw.-hr. per year and consumes all of the exhaust steam in process work. Coal is delivered to the bunkers at $5 per ton. The labor in the engine room requires two more watch engineers than would be required if no power were made. The plant consists of two uniflow-engine-generator units of 150 kw. each and one 350-kw. extraction turbine-generator unit. The boiler efficiency is 70%. The investment for the power equipment is $47,700 and the annual operating cost is $11,849.

The net cost per kw.-hr. would be $11,849 ÷ 1,200,000 = $0.00987.

The average mill today operates about 6,336 hours per year and, with a 400-kw. demand, in the above calculations the load factor becomes almost exactly 50%, which is a fair average load factor for a textile plant. Other factors remaining the same, the high-load-factor plant will make cheaper power. Thus, if the plant in the example had operated at 60% load factor, there would have been generated 1,500,000 kw.-hr., and the additional expense would have been only $335 for additional coal chargeable to power. The net cost per kw.-hr. under these conditons would have been ($11,849 + $335) ÷ 1,500,000 = $0.0082.

In making an analysis of a plant to determine the amount of by-product power that can be made with the consumption of all low-pressure steam from the engines or turbines, one must make a heat balance set-up in which load curves of the exhaust steam available from the power load are compared with the load curves of the low-pressure steam demand. After it is determined to what extent they follow each other, a tabulation of the monthly quantities may be made, in which the monthly use of exhaust steam of the different processes is balanced against the exhaust steam available from the engines. In this table the total weight of steam used per year in the heating system is divided up for the months and added to the process load. This analysis requires great care and study of the loads, but, if done correctly, will give the engineer a clear picture of the by-product power situation in his plant.

Monthly percentage of total yearly heating load

January	17.0%	July	00.0%
February	18.0	August	00.0
March	13.2	September	00.0
April	11.3	October	3.8
May	7.6	November	11.3
June	3.8	December	14.0

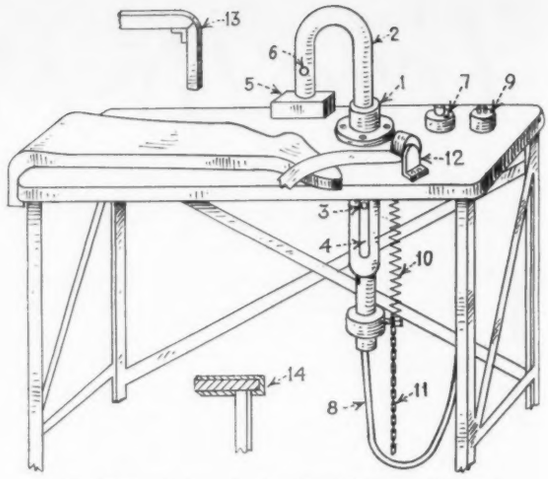
Hosiery Transfers

Can be applied efficiently when this simple device is used

By George E. Cottrell

FOR placing transfers on hosiery, the simple device shown in the accompanying sketch has been used for some time with satisfactory results in a mid-western mill. In using this device, the operator places six pairs of hose with the part to be stamped under the heating unit, draws the transfer strip to the proper position on the hose, and presses on the floor pedal to transfer the trade-mark, size, or other design.

In the sketch, 1 is a flanged casting with a reamed hole to admit the shaped steel tube, 2, so that the tube will slide freely up and down in the casting. A stud screw, 3, is screwed tightly into tube 2 and slides freely in a slot, 4, to constrain the tube so that it will have only a vertical movement. A transfer heating unit, 5, is firmly held in position by a set-screw, 6, and connected to a switch, 7, by a cable, 8, which passes inside of tube 2 as shown in the sketch. Shown also is the plug connection, 9, to the electric current supply. Tube 2 is held in its upward position by a spring, 10, and a chain, 11, connects it with a floor pedal to actuate the mechanism. A bracket, 12, holds the roll of transfers.



Equipment for placing transfers on hosiery

The frame of the table, except the braces, is made from $1\frac{1}{4}$x$1\frac{1}{4}$ in. angle steel and is welded together to form one piece. The braces are of 1x$\frac{1}{8}$ in. flat steel. The rim of the top is made from one piece of angle steel bent into a rectangular shape with round corners as shown in the sketch. The four legs are welded at the corners and the braces are welded in place to stiffen the legs. The top is made of wood fastened securely to the recess of the angle of the frame, as shown in 13. The wood should be of such thickness that, when a linoleum top is placed on it, the linoleum will be flush with the top of the frame, as illustrated in 14. It is well to glue the linoleum in place. After the table is finished, it should be smoothed carefully, to avoid danger of snagging the hose.

Institute initiates plans to improve

The Carpet Position

AT THE opening of the new carpet season early in August came announcement by the Institute of Carpet Manufacturers of America of a newly devised plan for promotion of better styling and selling.

Carpet merchandisers have recognized for some years that consumers were not "carpet conscious" to the extent that this attitude has definitely applied to automobiles, refrigerators, radios, and clothes. Carpet men know that the replacement market is by far their biggest field, but even in that market only a small fraction of potentialities are realized because consumers are satisfied with worn carpets, with out-moded carpets and with patterns inharmonious with their other furnishings. That side of the picture deals with consumer sluggishness. The promotional plan will attack this lethargy.

On the other side is the mill man's temptation to speculate by making up carpet and rug styles without adequate data. The promotional work has already started with a comprehensive report, circulated among members only, on style and color trends in floor coverings and home furnishings. This report contains tabulation of data from mills, distributors and others on volume of carpets and rugs moved, broken down by period of pattern, by color of ground, by geographical location, by size of town, by price range, by type of store, etc. It shows specifically what has been selling, and where.

The report also goes into sales of draperies and wall paper, and is valuable as an up-to-the-minute document on consumer acceptance of styles and colors on which the carpet manufacturer can base his activity on new lines. Since numerous mills make up stock without waiting for orders, this information should be a valuable guide.

Similar reports to keep members advised on the style position and sales trend will be a vital part of the work in the future. To correlate the home furnishings field into a unit, the "Style Trend Advisory Council" has been formed with the carpet committee members already named and cooperation expected from such industries as draperies, wall paper, furniture, etc. This cooperative effort will be aimed to improve the business of all elements in the home furnishings field. There are eight carpet and rug men on the Council under the chairmanship of Herbert Gutterson, president of Carpet Institute.

A publicity committee has also been set up for the purpose of telling the story of soft floor coverings and of guiding those on the firing line of distribution. The publicity committee consists of seven representatives with Leroy A. Beers, of the Carpet Institute, as acting chairman. Byron G. Moon Co., New York, has been appointed to direct the publicity.

Beyond the publicity, further merchandising helps will be given distributors in planning their sales, and in arranging for financing installment business. The whole movement is a logical extension of the Carpet Institute's activity which already includes statistical service, uniform cost accounting, etc.

It's sensible and helpful to keep accurate records of your

Experimental Fabrics

By E. P. Howard

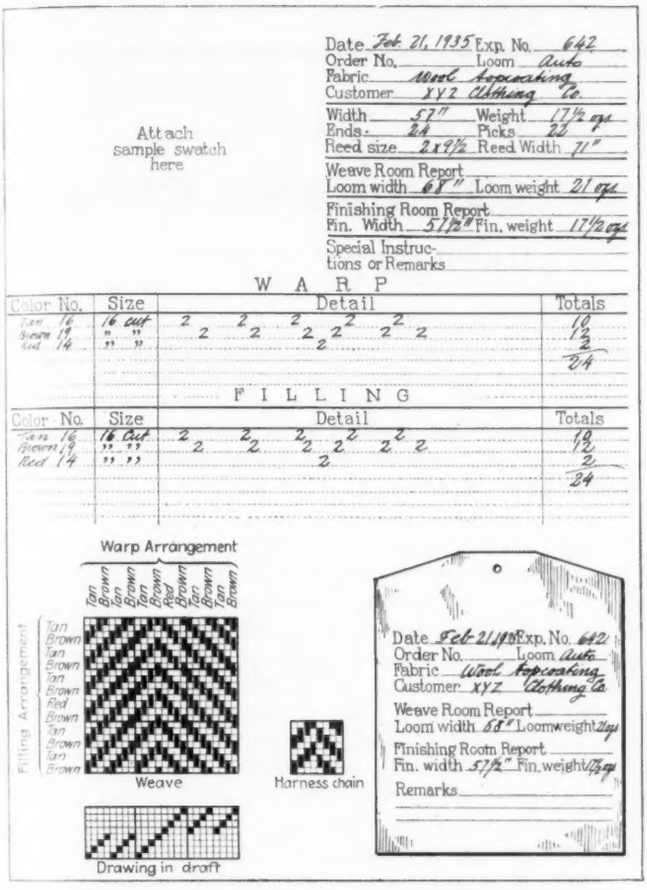

Attach sample swatch here
Date Feb. 21, 1935 Exp. No. 642
Order No. Loom Auto
Fabric Wool Topcoating
Customer XYZ Clothing Co.
Width 57" Weight 17½ oz
Ends: 24 Picks 22
Reed size 2x9½ Reed Width 71"
Weave Room Report
Loom width 58" Loom weight 21 oz
Finishing Room Report
Fin. Width 57½" Fin. weight 17½ oz
Special Instructions or Remarks
WARP
Color No. Size Detail Totals
Tan 16 16 cut 2 2 2 2 2 2 2 2 2 10
Brown 19 " " 2 2 2 2 2 2 2 2 2 12
Red 14 " " 2 2
24
FILLING
Color No. Size Detail Totals
Tan 16 16 cut 2 2 2 2 2 2 2 2 2 10
Brown 19 " " 2 2 2 2 2 2 2 2 2 12
Red 14 " " 2 2
24
Warp Arrangement
Tan Brown Tan Brown Tan Brown Red Brown Tan Brown Tan Brown
Filling Arrangement
Tan Brown Tan Brown Tan Brown Red Brown Tan Brown Tan Brown
Weave
Harness chain
Drawing in draft
Date Feb 21/35 Exp. No. 642
Order No. Loom Auto
Fabric Wool Topcoating
Customer XYZ Clothing Co.
Weave Room Report
Loom width 58" Loomweight 21oz
Finishing Room Report
Fin. width 57½" Fin. weight 17½oz
Remarks

Fig. 1. Form for keeping permanent records of experimental fabrics. Fig. 2 (at lower right corner) piece ticket which accompanies the sample through the mill.

WHILE most mills keep records of some sort concerning their experimental fabrics, as many times as not these sheets contain only fragmentary information. Often, too, only one set of records is kept, and the data on a given experiment may be in use in any one of a number of departments when they are wanted in another. Thus, time is wasted and the indiscriminate transfer of records from one department to another inevitably leads to some of the data becoming lost or mislaid.

The system described in this article has three main objectives: (1) to provide a definite record of every sample made, and of the materials and methods used; (2) to have these data within arm's reach of the designer, superintendent, and sales manager or stylist at all times; and (3) to cut down sampling costs by obviating, to a large extent, the possibility of unwittingly making two or more experimental ends of the same, or very similar, construction. The sales manager or stylist is included among those to receive technical data concerning experiments, as the day is fast passing when a sales manager is a mere high-pressure artist and a stylist a mere clipping gatherer. The forms shown in Figs. 1 and 2 were prepared after a study of numerous different types of record sheets actually in use in various organizations. However, it should be borne in mind that no one form can possibly adapt itself equally well to all types of fabrics, and that slight changes may occasionally prove desirable.

Sheets similar to that shown in Fig. 1 are suggested, both for laying out the experiments and for filing information about the completed fabrics and samples. A size about 8½ x 11 in. or 9 x 12 in. will prove most efficient. This will allow room for noting all important data and for stapling on good-sized swatches. These sheets should be of a grade of paper heavy enough to stand up under the strain of progressing through the mill with the experiments, but light enough to permit the making of two carbon copies.

Piece tickets, similar to that shown in Fig. 2, are also required. The necessary information should be filled in on these, in the mill, as soon as the experiment has progressed to the point where the desired facts are available.

As soon as the making of an experimental end is decided upon, a layout sheet, Fig. 1, is prepared in triplicate. On this is included:

1. Identifying data, such as date, experiment number, order number (if the experiment is being placed in work against a definite order), type of loom to be used, fabric name or type, and customer for whom the experimental end is being made.
2. Data on construction, such as width and weight desired, ends and picks to be in the finished cloth, reed size, denting arrangement, reed width, warp and filling details, and harness-chain and drawing-in drafts. (Mills using a considerable number of very large weaves, chains, or draws may prefer to omit the cross-section ruling at the bottom of the paper. In this case, the weaves, etc., may be worked up on separate cross-section paper, folded to convenient size, and attached to the forms.)

One copy of the layout is sent to the mill, and the fabric placed in work. Duplicate and triplicate copies are retained in the designing room until the completed cloth is received. At that time the balance of the data called for (i.e., loom width and weight, and finished width and weight) is filled in, samples are attached, and one copy is forwarded to the sales office or stylist.

Each copy should be filed in a permanent binder by the respective departments. If this plan is followed, the sheets will be ready for instant reference when and where such reference is necessary. Also, they will form a complete record of all experimental fabrics which have been produced, and, many times, when a new cloth is contemplated, a glance at the file books will be found an efficient substitute for, and much more economical than, the manufacture of additional experimental ends. Another advantage is that when it is desired to reproduce a fabric made at some previous time, it is not necessary to re-design the cloth, but only to refer to the proper layout sheet.

Overseers'

THIS DEPARTMENT

offers practical material for the use of overseers in meeting the daily problems of their jobs. It includes valuable suggestions on industrial relations in the handling of which both the overseer and the superintendent are involved. Under the heading "Kinks" appear short cuts in mill technique which have already solved problems in at least one mill and may help in yours. The central panel features material from a mill superintendent's diary which offers practical hints on various matters taken from actual mill experience. We solicit your contribution to this department—see panel on opposite page for details.

▼

Carrying Out Suggestions

Editor, Overseers' Corner:

Mr. William's comments on carrying out suggestions are very interesting, but he will find one or more overseers of the type mentioned in about every mill he comes in contact with.

I have held the position of overseer of carding for fourteen years and have worked under five different superintendents. I have always felt it my duty to carry out any suggestion the super makes. When an overseer gets *too big* to take orders from the super, he is *too small* to give orders to his second hand. When you find an overseer of this kind, and you can't convince him that you are the boss, the only thing I can see for the super to do is to change overseers.

P. A. WYNN.
Overseer Carding, Mandeville Mills.

Criticism and Cooperation

Editor, Overseers' Corner:

I think the superintendent takes a rather arbitrary attitude in the matter of the reactions which he expects to receive from his criticisms. He apparently has set up in his mind a set of standard reactions which he expects at all times, from all overseers under all conditions. We agree that his desired and expected reactions are the ideal types. They are responses we all hope we will give when as overseers and individuals we are faced with such criticisms. But we know that we may not react to a question or criticism at 4:30 p.m. when we are tired, in the same manner as we would at 9:00 a.m. when we are fresh (provided our wife hasn't dragged us out to a bridge party the night before).

Common courtesy, like common sense, is all too uncommon a factor in our industrial and business dealings. Courtesy is a two-way proposition. If the superintendent makes a courteous, impersonal approach to an overseer, he certainly is entitled to receive, and nearly 100% of the time will receive, a courteous response. If, on the other hand, his approach is with cold criticism and personal censure, the reaction is bound to be one of self-defence engendered basically by fear.

The superintendent must never forget that a wide gulf separates him, psychologically, from all of those under his domination. He holds their jobs, their purse-strings, their future happiness, and their prosperity in the palm of his hand. Whatever he says and the manner in which he says it is "colored" by the fear which "conditions" such a set of conditions.

May I here suggest that each superior of employees, whether his position be high or low, read such books as Overstreet's "Influencing Human Behavior," and "Keeping Young in Business," by E. B. Weiss and L. L. Snyder.

H. D. G.

Advancement for Women

Editor, Overseers' Corner:

Referring to a letter in the July issue, I certainly think there should be greater opportunity afforded women in the mills in the form of promotion to the position of forewoman. Some mills do have forewomen, but the majority do not.

I'm certain that in some departments where only women are employed it would be advantageous to have a forewoman. This woman would be promoted for all-around efficiency, particularly ability to do quality work, and would be qualified to watch and train the less experienced help. Certainly such a forewoman would be more helpful than an overseer who actually couldn't do the work even though he knew just how it should be done. I also think that the right kind of woman on the job would lead to better control and discipline.

A. COOPER.

Should Plan Better

Editor, Overseers' Corner:

More than 98% of an overseer's worth lies above his ears. If he does not use this part of his anatomy regularly to plan and organize his work, he will not amount to much.

To accomplish the desired results, an overseer must put in a considerable amount of his time doing constructive thinking and planning. He cannot do this if he spends his time dashing around from here to there and from this to that (possibly trying to impress his superiors with his industry), and doing jobs that should have been delegated to some one under him. When a $60 per week overseer puts in a lot of time on a $12 per week job, the company is bound to lose.

F. S. W.

From a Superintendent's Diary—

CHECKING UP ON

(Based on actual mill notes)

SOMETIMES when you make a mistake yourself it gets you thinking and some good comes of it. The other night I was reading over some of this diary of mine that I had written about six months ago and I came across some pretty good ideas that nothing had been done about because of the pressure of other matters. In other words, an idea may seem all right at the time, but something else comes up and you forget about it.

As a result of all my heavy thinking on this, I came to the conclusion that hereafter each overseer will receive a copy of the minutes of our weekly overseers' meetings and that every two months we will have a clean-up meeting. In preparation for this event, each overseer will be asked to look over the minutes of the seven previous meetings. There are a number of good suggestions casually made at the meetings and this plan will enable us to check up on those that have been side-tracked, discuss them a bit, and decide definitely whether they should be put into effect. After this meeting the overseers can throw away their copies of the minutes if they want, so they won't accumulate. For my part, I'm going to use this diary of mine more. For example, periodically we have the problem of cutting-down or stepping-up production. I know now that if we have to increase our production next week I can go back in my diary and find forgotten bits of previous

Overseers' Corner

IDEAS AND MACHINES

By John Williams

experience that will help us solve the various problems we face.

Getting down to immediate problems, there were a couple of matters I had to take up with the overseers at our last meeting. Some overseers get careless about checking up on how the machines are running and then blame the operative or the machine for poor work. To be specific, we have had several cases where machinery that had been idle for a time was started up and the overseer just casually looked things over before putting operatives to work. The chances are pretty good that bad work will result from such carelessness. The overseer should make it his job to be *sure* that a machine is operating properly before he turns it over to an operative. If the overseer doesn't see to it himself that everything is running right, you can't blame the operative for being equally casual and careless.

Somewhat along the same line is the fault that some overseers get into of not walking around the department to see how everything is going. I can't see how an overseer can know the efficient from the inefficient among his workers, or see that all the machinery is operating properly if he sits in some comfortable spot and leaves things to run themselves. I like to see an overseer who isn't afraid of some leg work and who circulates around his department enough to know personally what is going on.

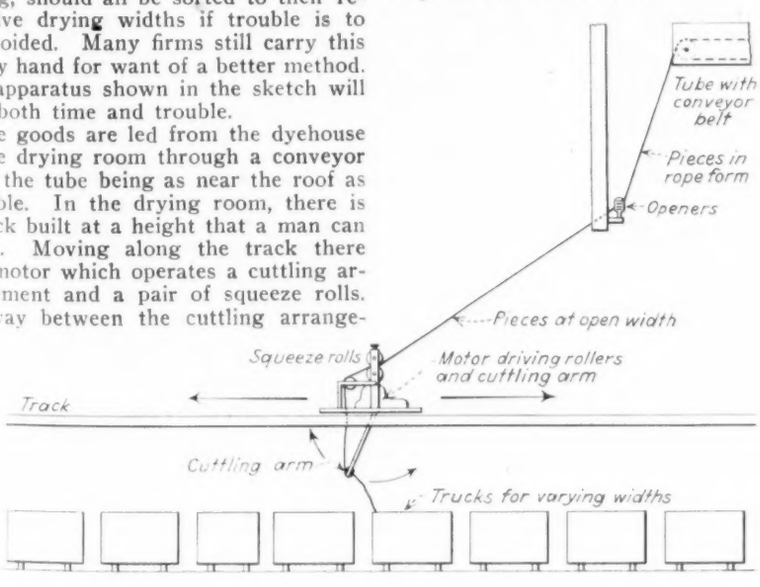
KINKS

Sorting Apparatus for Drying Machines

It is essential for both drying and cutting purposes that piece goods, after dyeing, should all be sorted to their respective drying widths if trouble is to be avoided. Many firms still carry this out by hand for want of a better method. The apparatus shown in the sketch will save both time and trouble.

The goods are led from the dyehouse to the drying room through a conveyor tube, the tube being as near the roof as possible. In the drying room, there is a track built at a height that a man can reach. Moving along the track there is a motor which operates a cuttling arrangement and a pair of squeeze rolls. Midway between the cuttling arrangement and the conveyor tube there is a suitable piece-opening apparatus to open the goods to full width.

The pieces are led from the conveyor tube to the openers. They pass downward to the squeeze rollers, through the cuttling arrangement, and are folded neatly into any one of the trucks that may be selected below.



CONTRIBUTIONS

to the "Overseers' Corner" will be paid for without regard to length. We will be glad to use letters discussing the super's diary or any other pertinent matter whether of mechanical, managerial or just plain human interest. Those who contribute kinks will be paid additional for an appropriate sketch to illustrate their device. It is not necessary to submit finished drawings. If these pages interest you—contribute something to them to interest others. Address Editor, Overseers' Corner, Textile World, 330 West 42d St., New York, N. Y.

▼

All goods are marked for width and the marked end passed forward first from the dyehouse. All the operative has to do is to find the width marked on the piece and run it into the appropriate truck, the cuttling arrangement being moved along the track for this purpose. One man is sufficient for the operation. In addition, no sewing-up of pieces is required in the dyehouse, as the ends may be simply knotted together; the piece ends being laid over the truck edges for stitching when required. As long a drop as possible should be given between the conveyor tube and the opener to insure easy opening.

G. L. A.

Stopping Slubs

This suggestion is intended for mills having spinning frames with wood thread boards.

When a heavy slub or thick end caused by bad roving or creeling comes through the thread guide, excessive ballooning takes place. Hang a small length of wire, about ¾ in. long, underneath the thread board on the extreme end near the thread guide. As soon as excessive ballooning takes place, the end catches on the wire and breaks; thus preventing bad work from going on the bobbin. The exact spot to hang the wire is determined by trying it out in different positions. The wire is shaped like a question mark (?) and is held in place by a staple holding the hook at the top, but must swing freely. A. D. N.

Spinning Bands

A spinning band poorly constructed, or poorly put on, is a constant source of bad yarn. A band-boy who is conscientious, who breaks off loose bands, and who is capable of putting on new bands as they should be put on is worth all the company pays him.

As a result of many experiments we found that the life of a band depends upon its construction and that it pays to use good cotton of at least 1-in. staple.

Our best band, made entirely of roving, was constructed as follows: use 1.80 hank roving with 3.75 turns twist per inch; twist four rovings 4.00 turns per inch; make the second twist 6.00 to 6.50 turns; 100 bands per lb. O.N.C.

QUESTIONS AND ANSWERS

Washboard in 3-Carrier Hosiery

Technical Editor:

We are sending you two stockings made from 7-thread, 10-turn, 81% silk, with an 8-thread reinforcement in the heel. These stockings are from a lot which had been bleached white, and the peculiar part is that there were three distinct shades—each running throughout the entire stocking. We are of the impression that the boiling-off process in handling this particular lot was not as thorough as it should be.

We are also sending one stocking of 7-thread, dark brown, which has been made on a 42-gage, 3-carrier machine. You will notice that a streak (or washboard, as it is called) is rather pronounced. We are quite certain that this is not due to any variation in the twist, and are more inclined to the belief that the humidification probably has not been as thorough as it should be for this type of work. We shall appreciate any information you can give us on these problems. (8234)

Referring first to the bleached hosiery, we would unhesitatingly say that this is what is commonly referred to as "two-tone." This trouble cannot be caused or corrected by the boiling-off process. It is one which can be greatly controlled by the throwster, but there are certain conditions in the mill which are beyond his control and which must be closely followed up if two-tone effects are to be eliminated. The two-tone problem is too generally understood to merit any lengthy discussion here, but we would comment particularly on the following point:

In changing from one lot of silk to another, the knitter should always make a dyeing test of the two lots of silk before mixing them on the machine. Where press-offs are topped back on the machine, they should be put back on the date of press-off and preferably within the same hour, and always on a head representing the same lot of silk from which the press-off was made. Transfer of legs to footers should take place not later than one day after the legs are made. It is a well-known fact that there is momentarily rapid oxidation of gum silk after it passes through the moistening troughs on the machine; and where this oxidation is allowed to develop for even two or three days, especially in hot weather, it is hardly possible to join such fabric to freshly knitted fabric and get uniform dyeing results. We refer to this specifically because we note one of your samples shows two-tone in the leg and also a different tone between foot and leg.

Regarding the serious washboard effect, the advisability of making a stocking of as heavy construction as 7-thread by the 3-carrier method is questionable. It is our opinion that washboard knitting will be very hard to control and difficult to correct in the finish on such heavy fabric.

With specific reference to the exaggerated condition of washboard shown in the upper part of your stocking, it is possible that this developed through uneven humidification. It is also possible that it developed through wide variation in the size of cones employed or some other condition well known to the well-trained knitter, such as uneven tension from wicks, gum in yarn eyes, gum in thread carriers

(both of the latter are also a form of uneven tension), etc.

Apart from all of these suggestions, we believe that 90% of washboard trouble is traceable directly to variation in the nature and diameter of the raw silk. This situation, which we believe a correct one, places 10% of the responsibility for washboard knitting on the knitter and 90% on the worm, and leaves the problem of washboard to be taken largely as a matter of course, with plenty of headaches in constant efforts to prevent and control the trouble.

Loss in Weight in Bleaching Knit Goods

Technical Editor:

One of our affiliated companies manufactures circular-knit cloth for underwear. It uses both carded and combed yarns. The cloth is sent to a commission dyehouse, and the question arose as to what percentage of loss in weight should occur in the bleaching of these goods. We shall greatly appreciate your advising us as to what customary procedure is followed in determining the basis for a calculation in matters of this sort. (8233)

The following conditions control weight loss. A single- or double-carded yarn will show more loss than a combed yarn. Cloth that is kier boiled under pressure for 8 or 10 hours and bleached by the chlorine method will show a greater loss than goods not kier boiled and bleached by the peroxide method. Cloth which is run through a good steaming system after coming from the dryer should not show as much shrinkage as cloth which has not been steamed. Finally cloth can be treated with a softener which also acts as a moisture-retainer to lower the percentage weight loss. Of course, re-bleaching will cause additional loss in weight.

An average weight loss for kier-boiled and chlorine-bleached, is 6%; for the same goods not kier-boiled and peroxide-bleached, 5%. These figures are based on records kept by one bleacher for a period of over 15 years, with between 2 and 3 million pounds bleached per year.

Leno Ends Bunched

Technical Editor:

I have trouble with a loom where I am working, and nobody seems to be able to overcome that trouble. The jumper yarn starts twisting from the drop wires to the back of the harness and bunches there. This occurs on only one side of the loom. It is a leno weave, twelve jumpers, two doups, two slackeners, and one dead rod, 50/1 warp, 36-in. wide in reed. Can you give me any advice on this? (8232)

This is a common trouble on clip-filling-spot marquisettes, in which many of the ground or pattern-making ends are drawn on the same harnesses and separated only by a doup end. The only way that bunching ends can be avoided is to pick a lease from the ground ends only. This will take a little time, but it worth while. The time required to pick the lease will be saved in increased production and quality during the life of the warp.

Mercerized Yarn Lacks Luster

Technical Editor:

I am inclosing a skein of cotton thread yarn, 40/3s Sak., gassed and mercerized. I am anxious to know the cause of the lack of luster and smoothness of this yarn. This is supposed to be a super-combed Sak. of unusual strength, yet, although the manufacturer states that it was gassed and mercerized, it is very fuzzy and has not the luster a good gassed and mercerized Sak. should have. I should also like to know if this yarn is really size 40/3 and what length of staple its breaking strength indicates. (8228)

It is our opinion that this yarn is not up to its purported quality, but is made of a somewhat inferior staple, which accounts for its inferior appearance. Since there are no very definite standards for such yarn, we suggest you untwist some of it to the single ply, then carefully untwist that and make a small pull of the staple. With a little patience, a comparative pull can be made from a yarn of known standard quality or from one which you have found to be satisfactory. We find such a pull from this yarn shorter than we believe it should be.

If this yarn is involved in a serious commercial dispute, it would be best to submit suitable comparative samples to some recognized testing laboratory for a more definite comparison of staple lengths.

Hosiery Spotted

Technical Editor:

We are inclosing one pair of 7-thread, service-weight stockings. We should like to know what is causing the spots in bleaching, as we are having considerable trouble with this. (8227)

Examination of the hosiery failed to disclose the cause of the spots, and you gave no details of the procedure that you are following from which we might get a clue. Spots most commonly encountered in bleached hosiery are those due to iron rust, mildew, calcium and magnesium soaps, and precipitates from the finishing bath. No spots were evident on the samples after they had been treated for 30 min. in a bath containing 10% degumming agent, 3% sodium silicate, and 3% of sodium metaphosphate; rinsed; and bleached for 40 min. in a peroxide bath containing 2% of sodium metaphosphate in addition to the usual amount of sodium silicate. It appears probable, therefore, that the spots are not due either to iron rust or mildew; but can be traced to faulty degumming or finishing. We suggest that you first check the water used in the dyehouse to make certain that it is free from hardness. If the water is satisfactory, next make sure that the degumming agent and any finishing material you are employing are not being precipitated from the bath and causing the trouble.

QUESTIONS AND ANSWERS

Twist Take-Up

Technical Editor:
We control our material inventories by means of theoretical yarn weights. At the present time we use 8x840 yd. per pound for 1/8, 2/16, and 3/24 cotton yarn. This practice is not strictly accurate, of course, because of the twist take-up. Can you help us with some tables of figures for both the cotton and rayon systems? (8213).

There is no general table available for this. There is, of course, contraction and elongation of yarns due to twisting. With single yarns, it is always contraction; but the size of the yarn is figured on the contracted length; therefore, your 1/8 yarn should have 8x840 yd. per pound. For ply yarns, the relation of single to ply twist establishes whether there is elongation or contraction. However, many yarns are spun so that when plied they give the equivalent of the count desired. For example, 2/16 is equivalent to 1/8, and you may find it is so spun that there is 8x840 yd. per pound.

One other factor is the tendency for mills to spin "on the heavy side." Very often yarns are intentionally spun slightly lower in number than indicated on the ticket.

We believe the only way to determine the relation of contraction to yarn count is by actual check-up on the yarns. If these things are to be checked, it is important to have a room with standard atmosphere, as the variations in regain at different humidities can make enough difference to upset all calculations.

Since this was written a study of twist take-up in rayon yarns has been completed by the Throwsters Research Institute, the United States Testing Co., and the National Federation of Textiles, Inc. The first data on the subject to be made generally available can be secured from the Federation, 10 East 40th St., New York.

Underwear Fabric Curls

Technical Editor:
We recently added plain knit fabric to our lines as produced on several Wildman machines which we operate. The cloth is knit on 28-cut machines from 50/1 combed peeler; is afterward bleached in the usual manner; is dried on hot-air pipes; and, after steaming and calendering, is cut from roll into garments, these latter being men's athletic shirts.

Our processing results appear to be entirely satisfactory, up to the point of attempting to sew the garments, where we experience extreme difficulty, due to the curling of the fabric, so that it is almost impossible to handle it on a production basis. This cloth might properly be termed balbriggan cloth, and we have been unable to locate any solution of the trouble from any of our textile kink books or textile books. (8208).

A method for preventing curling of balbriggan after the cloth has been cut was described in our September, 1934, issue. Briefly, it consists of running the fabric after it comes from the knitting machine, through a solution containing 3 oz. of cornstarch to 1 gal. of water. The starch will stay in the goods until they are cut, but will work itself out before the garments are boxed.

We have met many mill men who entertain the idea that any size of fabric can be made on any size of machine by just spreading the roll to the desired size. When the knit cloth is wet, it is very stretchy and gives easily. In drying the cloth on the upright dryers, with these machines running very slowly, it is possible to use excessively large spreaders; but the strain on the cloth between the spreaders and the rollers is a pull lengthwise of the cloth and this pull is greater when the cloth is running over too large a spreader. Consequently, there is not only an excessive pull on the cloth sideways, but also lengthwise.

If we take a piece of this cloth, no matter how handled in the finishing process, and stretch it over the hands, we see that the cloth immediately curls up at the edges. It is evident, therefore, that it would have a tendency to curl more after being subjected to too much spreading. The cloth when ready to cut should be as natural as possible, having been stretched neither sidewise nor lengthwise, as would be the case if too large a spreader were used either in drying the cloth or in steaming and spreading it afterward.

Ingenuity on the part of the sewing-machine machinist might be directed to the development of some improvement which would help feed in the curly fabric or take out the curl before it reached the needle.

Cotton Bags

Technical Editor:
Will you kindly furnish us with the following information relative to weaving of grain and flour bags: What are the average weights, constructions, etc., used in the making up of these bags? (8206)

Grain, flour, cement, sugar, and fertilizer bags are rarely woven as bags. They are fashioned from plain-woven print-cloth, sheeting, and osnaburg constructions. The print cloth is used as an inner lining for large burlap sugar bags and is used for the smaller sugar and salt bags. Sheeting is used for the making of flour and grain bags. Osnaburg is used for the making of cement and coarse grain bags. The constructions used for bag-making purposes are given below:

Print-cloth constructions:

27 in. 64x60 7.60 yd. per lb.
28 in. 64x60 7.30 yd. per lb.
32 in. 64x60 6.50 yd. per lb.
38½ in. 64x60 5.35 yd. per lb.

The different widths of course lend themselves to the making of the different sizes of bags.

Sheeting constructions

31 in. 48x48 5.00 yd. per lb.
32 in. 40x40 6.25 yd. per lb.
36 in. 40x40 6.15 yd. per lb.

Osnaburg constructions

30 in. 7.00 oz. per yard
40 in. 7.00 oz. per yard

Nep Yarn

Technical Editor:
I am inclosing a sample of spun-silk flake yarn which I wish to duplicate in a worsted yarn. Experiments conducted in the manufacture of this type of yarn have yielded results which are not quite satisfactory. Attempts have been made at introducing the flake at the gill box, but it has been found that this method produces a yarn in which the flakes are much too large. Furthermore, the flakes are not closely bound and have a tendency to drop off under light friction. You will note that the sample does not have these characteristics; the flakes are relatively small, and it is not easy to remove them.

I shall appreciate any information you may be able to send me on the manufacture of this type of yarn in worsted. It is desired to produce a yarn having one or more colors in the flake. (8252)

We classify the sample of yarn submitted as a nep yarn. To duplicate this yarn the following procedure is recommended: Obtain a supply of colored neps or nubs. The neps may be made by the usual method—setting a card to produce them to excess. The use of colored noils is not recommended because of the count limitation and the unevenness of the yarn produced. Using broken sliver or waste of combed stock, add the colored neps, feeding them in by a special attachment at the last worker on the first cylinder. If more than one color of nep is used, they must be blended as required before applying them at the card. For this yarn it may not be necessary to full the nubs, before they are used at the card.

The sliver from the card must not be combed. It may be used as desired at the first operation of drawing, either French or English system. The possibilities of blending may be taken full advantage of at this stage, blending as desired with the regular top. If the English system is used, it may be necessary to reduce the flyer speeds and increase the twist slightly in the drawing.

Moving Reeds

Technical Editor:
How much should a moving reed move, 1/16 or 1/4 inch? Should the shed be closed on a taffeta weave, moving reed, when the reed hits the cloth, or when the lay is farthest front? (8211)

Best results are usually obtained when moving reeds are set to move ¼ in. On heavy-pick constructions, however, it is better to increase the movement slightly.

Your second question is rather difficult to answer properly, as you do not state whether you have in mind raw silk, soft silk, or rayon and you do not give the details of the fiber you have in mind. Each particular fabric and each type of filling requires a different setting. If you are weaving raw stock, you should usually have the shed closed when the loom is on front center, disregarding the reed entirely. In certain constructions, however, you will find that such a setting will cut the filling off right at the edge of the warp. In such cases we advise setting the shed so that it is at least ¼ in. from the fell of the cloth.

THE PERSONAL PAGE

Richard T. Lennihan, former president of the liquidated Hamilton Woolen Co., Southbridge, Mass., has been made vice-president and general sales manager of Nashua Mfg. Co.

Russell T. Payne, of Worcester, Mass., has been elected a director of the Lockwood Mfg. Co., Waterville, Me.

Robert Fatherly, president of H. Schweizer, Inc., New York, has been elected president of Textile Designers' Guild of America.

John E. Rousmaniere has been appointed executive assistant to Elroy Curtis, president of Southeastern Cottons, Inc., New York. Mr. Rousmaniere had until recently been one of the selling agents of Amoskeag Mfg. Co. Previously he had been a partner in Minot, Hooper & Co. and in the old firm of Lawrence & Co.

Laurence J. Martin, formerly an executive officer of NRA and before that superintendent of production for Tubize-Chatillon Corp., Hopewell, Va., has been named as acting administrator of NRA.

William Myers, Jr., has been appointed general plant manager for all plants of the United States Finishing Co. in Norwich and Sterling, Conn.; Providence and Pawtucket, R. I., and Hartsville, N. C. He has been resident manager of the Norwich plant since August, 1933, when he succeeded the late John F. Rogers, and previously was technical director for all plants. He has served U.S.F. 20 years. Mr. Myers is succeeded by **Charles F. Watkins,** assistant, as resident manager. **John B. Dick,** superintendent of printing, moves up to Mr. Watkins' former post and is succeeded by **Covert Filz** of Eddystone, Pa.

A. F. Burgess, formerly with Bates Mfg., Lewiston, Me., has been appointed superintendent of the Taber Mill, New Bedford, Mass., which will specialize on rayon fabrics.

Frederick W. Tipper, vice-president of Deering, Milliken & Co., New York, and general manager of its woolen department, has resigned. He will continue his association there until a successor is appointed.

William H. Hodgson, mill superintendent and designer of fancy worsteds and woolens, formerly with various New England mills, has become associated with the men's wear division of Botany Worsted Mills, Passaic, N. J.

C. W. McSwain, for the last nine years manager of the Pendleton Mfg. Co., La France, S. C., and prior to that assistant general manager of Victor-Monaghan Co., Greenville, S. C., has assumed the position of agent in connection with cotton utilization products sponsored by the Bureau of Agricultural Economics. This work is done cooperatively by the Department of Agriculture and the Textile School of North Carolina State College. He succeeds **J. A. Brown** who has conducted this work for the last five years.

Henry J. Viens, general superintendent of Lorraine Mfg. Co., Pawtucket, R. I., was elected president of the Textile Associates Club at the annual meeting held at Oak Bluffs, Mass. Other officers elected were: **Alfred Pate,** vice-pres.; **Ernest Witworth,** secy.-treas.; **John Dawson,** asst. secy.; and George Hutchinson, auditor.

Andrew Younger has been promoted to the position of resident agent of the Pioneer Mills, American Woolen Co., Pittsfield, Maine, to fill the vacancy caused by the recent death of Charles H. Park.

Samuel R. Knouse has retired from active management of the United Underwear Mill, Boyertown, Pa., and has been succeeded by **William Haas,** formerly connected with the Royal Knitting Mills, Reading, Pa.

Charles C. Smith, for the last six years superintendent of the Hamlet Textile Co., Pawtucket, R. I., has been appointed manager of the Darlington Fabrics Co., Newton, N. J.

Robert Dince has been appointed superintendent of Brookside Mfg. Co., Chatham, N. Y.

William Stainton, assistant superintendent of Otis Co., Three Rivers, Mass., has been made superintendent of Boston Duck Mills of the company at Bondsville, Mass.

D. O. Bryant has resigned as superintendent of Arnall Mills, Sargent, Ga., succeeded by **R. T. Smith,** formerly superintendent of Mills Nos. 1 and 2, American Cotton Mills, Bessemer City, N. C.

James L. Beard, formerly with Cliffside Mills, Avondale, N. C., has been made superintendent of weaving at the Riverside division of Riverside & Dan River Cotton Mills, Danville, Va.

James Callander has become sales manager of Associated Textiles of Canada, Ltd., silk and rayon manufacturers, Louiseville, Que.

Charles E. Menefee, formerly secretary and manager of the Waldensian Weavers, Inc., Valdese, N. C., has accepted a position as cotton mill specialty agent with Iselin-Jefferson Co., New York. Mr. Menefee will serve temporarily in the South, going to New York later.

A New Kind of "Foreign Exchange"

We have lately been approached by a German woolen manufacturer who would like to get for his son (23 years old) a paid job in an American woolen mill for six months or more. In exchange this German executive will employ on a similar basis any young American whom the employer of his son may send him.

Ernest Johnson, recently agent of National & Providence Mills, American Woolen Co., has resigned and joined Arlington Mills, Lawrence, Mass., in charge of worsted fabric production and worsted weaving yarns. Mr. Johnson started with the Washington Mill 40 years ago as a boy and rose to be agent of that mill.

H. H. Willis, dean of the Clemson College (S. C.) Textile School, announces the addition of several new professors and instructors for the coming year. **Joseph Lindsay, Jr.,** for nine years with General Dyestuffs Corp., has become professor of textile chemistry and dyeing. He is a graduate of Erskine College and has done considerable graduate work in chemistry at the University of North Carolina, University of Chicago and at the Philadelphia Textile School. **Bratton Williams,** who has been teaching textiles at Calhoun Falls, S. C., and who has had five years' practical manufacturing experience, has been added to the weaving and designing department. He graduated from Clemson Textile School in 1925. **Thomas H. Nelson,** for the last two and a half years with Riverside & Dan River Cotton Mills, Inc., has also been added to the teaching staff. He received a Master's degree in 1929 from the Textile School of North Carolina State College.

L. R. Champion, for fourteen years general overseer of carding at Alexander Mfg. Co., Forest City, N. C., and for the last two years at Springs Cotton Mills, Fort Mill, S. C., is now holding a similar position at Monarch Mills, Union, S. C.

W. A. Hunt, assistant superintendent Meritas Mills, Columbus, Ga., has been promoted to superintendent and succeeded by **Walter Hudson.**

S. R. Powers, superintendent of Chadwick Hoskins Co., Pineville, N. C., has accepted a position as superintendent of Jackson Mill No. 3, High Shoals, N. C., formerly known as High Shoals Mill. He was succeeded by **J. C. Tipton,** superintendent, Chadwick Hoskins Mill No. 4 (Louise Mill) Charlotte, N. C., who will be in charge of both plants.

J. S. Neely, formerly with Standard-Coosa - Thatcher Co., Chattanooga, Tenn., is now superintendent of Modena plant, Ranlo Mfg. Co., Gastonia, N. C., succeeding **J. T. McGregor, Jr.,** who recently resigned to accept a position with duPont Co.

Holland E. Shoaf, Lexington, N. C., has been elected vice-president of Asheboro (N. C.) Hosiery Mills and will be in charge of sales.

W. L. Myers has been made overseer of carding at High Point (N. C.) Yarn Mills, Inc., succeeding **B. M. Morton.**

Chris Suber, Jr., Clemson textile graduate of 1931, is now designer and overseer rayon processing at the Ladlassie plant of Gossett Mills, Anderson, S. C.

H. L. Dillard, assistant superintendent of Eagle & Phenix Mill, Columbus, Ga., has been appointed superintendent, succeeding **J. W. McElhannon,** who is now general manager of Waverly Mills, Inc., Laurinburg, N. C.

Donald H. Jonas, formerly with Boger & Crawford Spinning Mills, Lincolnton, N. C., has accepted a position with Johnston Mfg. Co., Charlotte, N. C.

Arthur Nebel has been appointed secretary of Nebel Knitting Co., Inc., Charlotte, N. C.

B. C. Moffatt has tendered his resignation as purchasing agent for Rock Hill (S. C.) Printing & Finishing Co.

Harry H. Burton, production manager of Lonsdale (R. I.) Co., has been made a member of Goddard Bros., managing agents for the mills, to succeed **John O. Ames** who resigned because of ill health.

T. F. Cuddy, formerly superintendent of the Nims and Woodlawn Mills, has been transferred to a similar position with the Adrian and Madora plants of the American Yarn & Processing Co., Mount Holly, N. C., succeeding **N. P. Baumgardner,** retired.

E. C. Merchant, formerly of Douglasville, Ga., has become overseer of weaving at the Springs Cotton Mills, Lancaster, S. C.

Ben P. Greene, formerly associated with the Standard-Coosa-Thatcher Co., Chattanooga, Tenn., is now general superintendent of all of the spinning plants of the American Yarn & Processing Co., Mount Holly, N. C.

W. B. Phelps, Jr., has been appointed New England representative for Johnston Mfg. Co., Charlotte, N. C., and will make his headquarters at 52 Chauncy St.

John W. Simpson, Jr., who has been for a number of years, connected with the Mathewes, Crews & Lucas Co., spot cotton brokers, recently resigned to become southern sales representative of the China Grove (N. C.) Cotton Mills Co., Inc.

Charles R. Bower has completed 50 years of service with the Acadia Mills, Lawrence, Mass. For the last 30 years he has served as overseer.

Obituary

James Sinclair, aged 65, president of the Fall River Cotton Manufacturers Association, and treasurer of the Charlton Mills, Fall River, Mass., died Aug. 27, at Westport, Mass. Born in Glasgow, Scotland, Mr. Sinclair came to this country in boyhood and secured employment in Wampanoag Mills, Fall River, that marking the start of a long textile career. He was president of Durfee Textile School and had many civic and financial affiliations at the time of his death.

D. D. Little, Sr., aged 76, president and treasurer of Florence Mills, Forest City, N. C., and affiliated with various other textile firms, died in Greensboro, N. C., on Aug. 15.

G. Bion Allen, formerly president of J. & P. Coats Co., Pawtucket, R. I., who resigned five years ago after 50 years with the firm, died Sept. 8.

Dr. Arthur Dehon Little, aged 71, founder and chairman of the board of Arthur D. Little, Inc., Cambridge, Mass., chemists and engineers, died on Aug. 1.

Rodman P. Snelling, aged 74, vice-president and a director of the Saco-Lowell Shops, Boston, Mass., died on Aug. 15. He was a director of the Nashua Mfg. Co. and trustee of the Ludlow Mfg. Associates.

Ernest D. Royce, aged 60, formerly general manger of the Great Falls Woolen Co., Somersworth, N. H., died at his home in that place Aug. 13.

C. B. Seal, aged 57, formerly director of A. French Textile School, Georgia Institute of Technology, Atlanta, Ga., and for the last eight years southern manager of Philadelphia Felt Co., died at his home in Tacoma Park, Washington, D. C.

Henry P. Hunter, aged 75, formerly superintendent of the Equinox and Gluck Mills, Anderson, S. C., died recently.

William Arran, representative of James Hunter Machine Co. in New York, Philadelphia and the South, died Aug. 31 at his home in Drexel Hill, Philadelphia. He was with the company for 20 years.

Col. W. F. Eaton, general manager of the Eaton Knitting Co., Hamilton, Ont., died recently.

Carl M. Jersild, aged 48, superintendent, Jersild Knitting Co., Neenah, Wis., died at his home recently.

Thomas Kerr, designer, Cleveland Cloth Mills, Shelby, N. C., was killed Aug. 30 in an automobile accident.

W. J. Thackston, retired textile manufacturer, who organized Brandon Mills, Greenville, S. C., and other firms, died Aug. 29 in Greenville.

John Cannan, aged 55, president of Trico Worsted Co., Philadelphia, was killed in an elevator accident recently.

Charles Hutchinson Park, resident manager of the Pioneer Mills of American Woolen Co., Pittsfield, Me., died in New York, Aug. 29.

Alvin S. Berger, aged 37, Chicago representative of American Yarn & Processing Co., Mt. Holly, N. C., was killed in an automobile accident in Ohio.

Alfred D. Israel, aged 83, famous for his collection of designs, died in Staten Island, N. Y., on Aug. 20.

Henry Hunter Smith Handy, aged 78, former president of the Semet-Solvay Co., and vice-president of the Allied Chemical & Dye Corp., died on Aug. 9.

Lancashire Wages Legalized

For the first time in the history of the Lancashire cotton industry, legalized wages are being paid to weavers. For two and a half years, states the London *Times,* a steadily increasing number of manufacturers have been reducing weavers' wages by amounts ranging from 5 to 20%. At one stroke, it adds, wage-cutting has been abolished and all manufacturers must now pay wages in accordance with the new legalized agreement.

Over 80% of weavers are engaged on four or fewer looms. As compared with the last agreement their wages have been reduced by 5.8%, equal to 1s. 2d. in the £. Actually, however, most of the weavers had been receiving much less than the list wages, so that they now get an increase instead of a reduction.

FHA Loans Now Apply to Certain Movable Equipment

FHA has issued a booklet amplifying its policies regarding eligibility of equipment and machinery for insured loans. In addition to that which becomes permanently attached to the real estate, FHA is now prepared to guarantee on a 20% basis loans for movable equipment and machinery that meet certain requirements.

Opens Fall Textile Class

James Chittick, textile specialist, New York, will open his autumn class in textile instruction beginning Monday, Oct. 7. There will be 16 sessions, one session weekly on Monday evenings. The course covers silks, rayons, cottons, woolens, linens, velvets, etc., from raw materials to finished goods.

Textile Calendar

Master Mechanics Division of Southern Textile Association, fall meeting, Gastonia, N. C., Sept. 20, 1935.

Silk Parade, Sept. 23 to 28, 1935.

Textile Operating Executives of Georgia, fall meeting, Georgia Institute of Technology, Atlanta, Ga., Sept. 28, 1935.

Committee D-13, A.S.T.M., fall meeting, New York, Oct. 17 and 18, 1935.

Cotton-Textile Institute, annual meeting, New York, Oct. 23, 1935.

Fifteenth Exposition of Chemical Industries, Grand Central Palace, New York, Dec. 2-7, 1935.

American Association of Textile Chemists, annual meeting, Chattanooga, Tenn., Dec. 6 and 7, 1935.

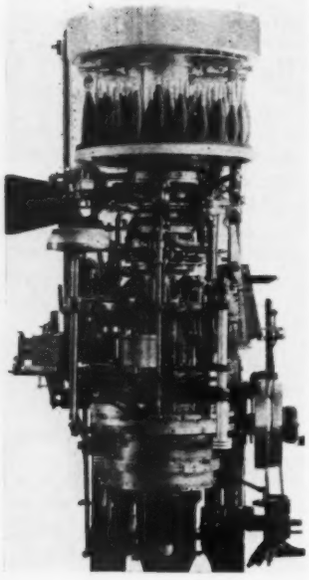
The Taxing of Designs

A legal report on the status of designs with respect to the New York City sales tax of 2% has been prepared for members of the Textile Designers Guild by Sylvan Gotshal, attorney for the Guild. Mr. Gotshal's opinion states that the only material questions relating to payment of tax are: Where did the sale originate? Where was it consummated? Where was actual delivery made to the purchaser? The opinion also cites various examples. In one case, where both seller and purchaser conduct their negotiations of sale and the delivery is made in the City of New York, the sale is clearly taxable; in a second case where the seller is in the City and the purchaser coming from out of town accepts the merchandise in the City, the sale is taxable.

Germans Spin Paper

The Germans have developed a new paper yarn known as Zellulongarn, according to a report from the American consulate-general, Frankfort-on-Main. The yarn is spun direct from pulp and, according to the meagre details given, corresponds closely to the Solka yarn developed a few years ago by Brown Co., Portland, Maine. (TEXTILE WORLD, June, 1933, page 83.)

NEW MACHINERY



Multiple- and Single-Needle Wrap Knitter

A year ago Standard-Trump Bros. Machine Co., Inc., 366 Broadway, New York, applied shogging to its model 80W hosiery knitter, thereby materially increasing the patterning scope of a machine already capable of wrapping 80 individual needles. This year Standard has applied a multiple-needle wrap to the 80W which permits the machine to wrap from one to four needles, thus presenting the hosiery designer with increased possibilities in the development of varied patterns.

The multiple-needle wrapping mechanism differs little in principle from that of other panel-wrap machines and requires no special description here.

Even without using an individual needle wrap, the designer can now employ, if he chooses, 80 panels in one hose; or he can place individual needle stripes side by side with wide stripes; or, if his machine is equipped for shogging, he can panel wrap and individual-needle wrap in the same wale. In the large argyle diamonds several colors can be employed.

Sewing Machine for Bulky Fabrics

A modification of the Coronation sewing machine, designed to handle bulky fabrics, has been placed on the market by Birch Bros., Inc., Somerville, Mass. This machine has a needle lift of 1¼ in. and is available with either foot or motor drive. The motor is of the 110-volt, single phase, 60-cycle type and is fitted with an explosion-proof switch. A Reelite keeps slack from the 25-ft. cable off the floor.

Circular-Hosiery Developments

Four innovations have been applied this year by Scott & Williams, Inc., 366 Broadway, New York, to two of its better-known hosiery machines. As a result, the model K, which knits hosiery with an automatically turned welt, can be equipped to lay in rubber or to knit alternate courses from different yarns; and the model HH, which knits half hose with a rib top, can also be equipped to lay in rubber or to knit terry cloth.

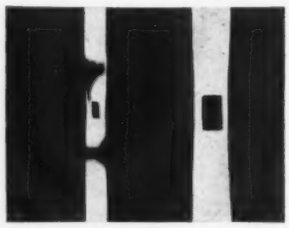
With respect to the use of rubber on the model K, the rubber is laid into the inside layer of the plain welt fabric by interlacing it with the sinker wales. Thus the outer layer is left free for patterning, as illustrated by the accompanying photograph of a knee-length hose, and there is no interference with the knitting of a picot edge. The attachment operates on the same principle as an auxiliary feed, and is new mainly in its application to this particular machine. A special set of jacks is operated by a jack raising cam to raise every other needle to take the rubber. The rubber thus taken naturally lies behind the other

needles. The sinkers enter to hold the rubber down while the needles are raised to take yarn at the main feed. A special tension is required to control the rubber, as is also a cutter for severing it when the lay-in portion is completed. The attachment is particularly adapted to the use of bare rubber, but it can handle covered-rubber yarns as well.

For the model HH the lay-in attachment is somewhat similar, but in this case the rubber must be laid in between the front and back wales of the rib top. Two needles which are ordinarily idle during the knitting of the top are raised to take the rubber and pull it down into laying position. At the present time the attachment is applicable only to the knitting of plain, sinker-reverse-plated, spiral or spiral imitation-wrap hosiery, but Scott & Williams expect shortly to announce a universal attachment which can be applied easily to any machine that knits a hem or rib, except the HH-PW.

The use of two feeds in knitting seamless hosiery is new only in its application to the model K. Although multifeeds are far more common than single feeds on circular outerwear and underwear machinery, the problem in the case of a hosiery machine is one of finding room for the extra feed, and as at present designed the model K with two feeds can splice on only one of them. Since, with this attachment, every other course is knitted from a different yarn package, irregularities in the yarn are less evident in the completed hose and a "ringless" effect is secured.

Achieving the knitting of terry fabric on the model HH was a matter of adapting five-step sinker reverse plating to the knitting of extra long loops of one of the two yarns employed. This was done by designing a sinker with a special neb which would take one yarn over the neb and the other in the throat of the sinker.



Heddle for Weaving Tinsel

Because of the increased interest in tinsel dress goods, Steel Heddle Mfg. Co., 2100 W. Allegheny Ave., Philadelphia, has developed a special "streamlined" heddle for use in weaving metal "threads." Since the friction created by this type of thread passing through a heddle eye is said to be much greater than the friction created by vegetable, animal, and synthetic yarns, this new heddle embodies a highly polished eye shaped to take care of the flat strips of metal.

Bearing Surfaces

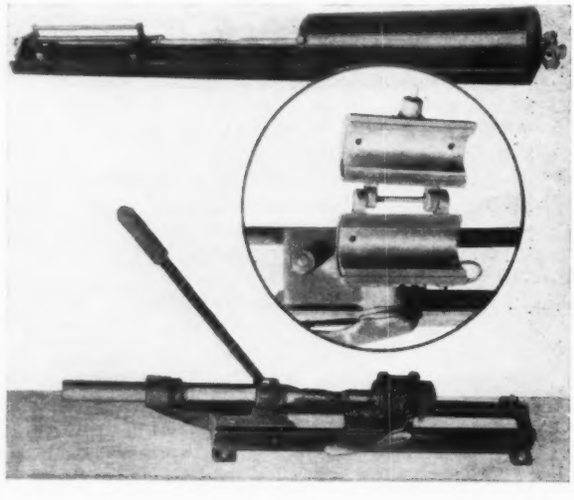
An innovation in surface finishing, known as Mirror finish, is being applied to Timken bearings as rapidly as special equipment can be built and installed, according to a recent announcement by Timken Roller Bearing Co., Canton, Ohio. This new finish is the result of several years research at the University of Michigan under the direction of Dr. E. J. Abbott, research physicist, who asserts that Mirror surface has been measured for flaws to one-millionth inch. In order to measure surface finish, Dr. Abbott developed a device called Profilograph which is now in use at the Timken plant. This instrument consists essentially of a fine diamond point connected to an optical system which magnifies its movement as it makes a trace on the highly polished surface. It is maintained that a vertical magnification of 2,000 times is necessary to show the most minute irregularities in the new surface.

Seamless Cork Cot and Assembly Devices

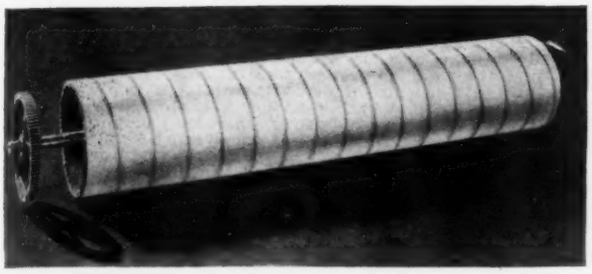
A seamless cork cot, a new tail-stock attachment for the assembling machine, and a pneumatic machine for assembling long seamless cots have been developed by Armstrong Cork Products Co., Lancaster, Pa. The new cot, known as Extra Cushion, is made by a special method called the tubular process, in which the cork is compressed in small charges under uniform pressure. This pressure is released at the desired density, which is kept uniform by allowing the heat during baking to penetrate only the thickness of the cot. A new-type adhesive, non-soluble in water, but soluble in an inexpensive solution non-corrosive to rolls, provides a strong bond. Advantages cited for the new cot include production of better yarn, less end breakage, easier start-ups on Monday mornings, satisfactory operation in connection with old equipment and resistance to abuse from hard ends and top roll laps.

The tail stock attachment eliminates all lengthwise compression of the cot during assembly and prevents tearing or splitting of tight cots. This is accomplished by gripping the cot firmly over its entire length as the roll is inserted. A positioning stop is designed to speed up the operation and place the cot accurately on the roll.

The assembling machine consists essentially of two parts: (1) a cavity or clamp in which the cot is placed, and (2) a cylinder with a plunger which is connected with a compressed air line. The cot is first placed in the cavity and the lid clamped down, holding the cot firmly and eliminating entirely any tendency for compression. The roll is then placed in position and a turn of the compressed air valve forces the plunger forward, engaging the roll and pushing it into the cot. An adjustable screw stops the roll when the cot is correctly positioned. This machine is designed for assembling cots to any of the longer rolls used in a cotton mill.



AND PROCESSES



Covering for Take-up Rolls

Carborundum Co., Niagara Falls, N. Y., is offering the textile industry a new covering for take-up rolls. This new covering, which is known as Texalox, is a strong flexible material of cloth-backing coated with evenly graded granular particles over which a thin film of metal covers any sharp or protruding points. The new covering is available in various degrees of coarseness for use with every type of textile fabric. Advantages of the covering cited by manufacturers include the following: samples have been tested for five years in mills and show no appreciable wear; evenly spaced, dulled points prevent cuts and chafe marks in the fabric and yet given an even positive grip; metallic coat makes covering impervious to temperature changes and oil and grease; cleaning does not injure surface of covering. This material is available in 3 in. (wider by special order) strips in rolls to 300 ft. in length.

Electrical-Control Devices

General Electric Co., Schenectady, N. Y., announces a number of additions to its line of electrical control devices. Included in these developments are an induction regulator, a step regulator, a step voltage booster, an automatic voltage adjuster, and a small oil-blast circuit breaker.

The branch-feeder induction regulator is designed to provide efficient and automatic regulation of branch and rural lines from 10% boost to 10% lower. This regulator is particularly applicable where smooth induction-type regulation is desired, but load conditions do not justify a conventional station-type regulator. It operates exactly as the station-type regulator, the difference being that it is designed for pole-mounting in order to eliminate land purchase and foundation expense.

The branch-feeder step voltage regulator also is suitable for pole mounting, since it is very compact. It provides four steps of 2½% each which can be arranged within the 10% total range for all boost, all lower, or any combination of boost and lower. This flexibility means that the regulator is applicable to circuits requiring regulation to 2½%, yet not requiring induction regulation. A plainly visible dial on the outside of the tank shows the operating position of the regulator at all times.

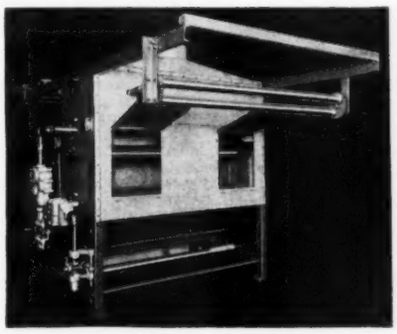
The branch-feeder step voltage booster provides a single definite boost in feeder voltage, such as required by periodic heavy demands of mill lighting loads, etc. This voltage booster is particularly suitable for use on single-phase rural circuits and lightly loaded branch circuits where more expensive regulators are not justified. When the voltage drops below a predetermined level, the booster automatically provides a single boost of 2½, 5, 7½, or 10%. On the other hand, should the voltage exceed a predetermined upper level, the booster returns to a neutral position where it remains until the voltage again drops below the lower limit.

An automatic generator-voltage adjuster, designated as Type G4, has been developed for use with small a-c. generators, synchronous motors, synchronous condensers, and d-c. generators. This adjuster is intended for use where voltage regulating requirements are not too exacting. It consists of a voltage-sensitive element of the movable-core solenoid type which operates, through levers, a wide-range quick-acting rheostat. This rheostat is connected in the exciter shunt field circuit, and any change in voltage is corrected by direct action of the solenoid on the rheostat. The solenoid is used for either a-c. or d-c. current and is excited through a fixed resistor from the generator armature potential. An air dash pot provides anti-hunting action.

An oil-blast circuit breaker, known as FK-42, is especially applicable where space is limited. Features include compact construction, silver-to-silver main contacts protected by arcing contacts, oil-blast baffles to assure high-speed interruption with short arcs and minimum oil deterioration, Herkolite bushings to give mechanical and dialectric strength, single tank for all poles to save time during inspections and to economize on space, frame and tank of plate metal with all joints electrically welded, and internal mechanism without external moving parts to increase clearance and facilitate connections. Provision is made for mounting directly back of panels, in switch houses or in metal-inclosed switchgear. This circuit breaker may be operated either manually or electrically.

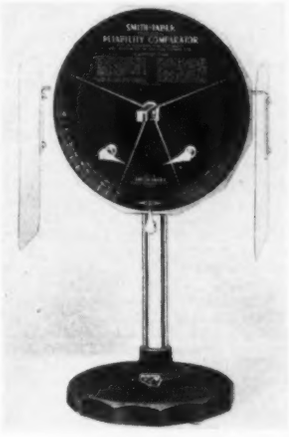
High-Speed Singeing Machine

Cloth speeds up to 300 yd. per minute are made possible with a new singeing machine developed recently by H. W. Butterworth & Sons Co., Philadelphia. The new high-speed singer is of the two-flame type with burners 60 in. wide for goods 48 in. wide, arranged with stop-offs for 48 in. The machine is designed to singe one side of the cloth with two burners, or two sides with one burner each. It is equipped with the latest type Kemp burners, 3-in. control valve, wet-out box, sparking rolls, and delivery reel at the back. The hood is of galvanized iron covering in the front end. Burners are readily accessible. The top of the hood is arranged for a round flue, which can be taken out through the roof. The machine is fitted with an overhead tension frame and with swing tension bars for feeding the goods. It is driven by belt direct from the motor.



Pliability Comparator

A pliability comparator to provide a quick and accurate means of checking and controlling quantitative and qualitative factors relative to pliability of textiles is announced by Smith-Tabor Co., North Tonawanda, N. Y. The sample to be tested for resiliency, elasticity, etc., is placed in a clamp and rotated until it touches a gage which registers on a dial. From this reading, pliability may be calculated in percentage. Also, the comparator is said to be instrumental in determining softness or feel of materials, although it is pointed out that, as yet, the latter is a factor which cannot be accurately measured. Special uses include setting up and controlling sizing operations, checking laboratory runs made in advance of mill production, determining the effect of various weaves and twists with reference to pliability and studying the effect of Sanforizing and other shrinking processes.



High-Pressure Barrel Pump

A high-pressure, air-operated barrel pump, which converts any original 100-lb. lubricant container into a power gun for industrial lubrication, is announced by Alemite Division of Stewart-Warner Corp., Chicago. A low-pressure pump, utilizing a nitralloy piston, carries a continuous flow of lubricant from the container to a high-pressure pump, from which it is delivered at the rate of 18 oz. of regular or 6½ oz. of heavy grease per minute. There is sufficient pressure to furnish a delivery to several outlets. Direct flow of lubricant from container to pump prevents contamination and dripping on floor or machinery. Removal of the barrel pump's top cover, held in place with one bolt, offers access to all working parts of the double-action air motor. Check valve may be cleaned without detaching hose from gun. Either a three- or four-wheeled truck for portability or a base for stationary installation is available.

Oil-Resistant Belting

L. H. Gilmer Co., Tacony, Philadelphia, announces a new rubber-fabric belt said to be 100% oil resistant. This belt, made in V-type and flat Kable Kord, has the same general qualities of the regular line, plus certain compounds designed to make it impervious to oils.

Roll Covering

Onco, a new textile roll covering made of pliable Solka, is announced by Brown Co., Portland, Me. Advantages cited by the manufacturers include uniformity, resistance to abrasion, resistance to chipping, freedom from static electricity which causes roving to lick up and lap around rolls, and absence of waste. In making cots for textile rolls, long strips for skiving are cut lengthwise of the sheet as leather is cut parallel to the spine. The strips require no hand staking, as stretch is said to be uniform and high, the latter feature permitting a snug fit in the finished roll. The usual isinglass glue is satisfactory when prop-

erly mixed and sizing is not necessary. Onco is designed to be run at 60 to 70% humidity. In event lower humidities cause the material to stiffen somewhat, a damp cloth applied according to instructions is said to eliminate any difficulty which might develop.

Smooth-Surface Metallic Screens

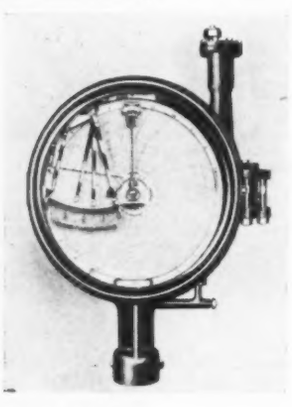
Metallic screens of fine mesh and smooth surface have been placed on the market recently by Electrolytic Products Corp., 250 West 39th St., New York. The screens are produced by electrolytic deposition in the form of a single piece of metal in any desired mesh and as fine as 160,000 holes per sq.in. In general, the screens can be made of any metal or combination of metals which can be electrolytically deposited and in any desired thickness from a fraction of one thousandth up to several thousandths of an inch. Suggested uses for the screens in the textile industry are for sifting, straining, filtering, and for screen printing.

Auxiliary Relay

Designed for continuous duty, a small, sturdy, a-c. or d-c. auxiliary relay, suitable for switchboard or panel mounting, is announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The model used for switchboard mounting has a molded cover or glass-front molded cover; the model used for panel mounting requires no cover. Both types have two independent contact circuits which may be adjusted for circuit-opening or closing service.

Universal Meter

A universal meter, designed to measure any fluid under any industrial condition, has been placed on the market recently by Foxboro Co., Foxboro, Mass. The instrument has a flow rangeability of ten to one, and is said to be suited for conditions ranging from simple recording requirements to conditions demanding pressure compensation or correlated temperature, pressure, and flow records. A new mechanical integrator shows the total flow on an easily read chart. The chart is uniformly graduated, and temperature and pressure records may be recorded on the same chart with the flow. A recording pen may be added, which makes a mark on the chart rim when the integrator adds a given amount to its count. Multiple pens, when used, do not interfere with one another. A pressure compensator is furnished for use where varying static pressure makes it necessary to correct both the record and the indicator readings instantaneously, automatically, and continuously.



Business Literature

Instruments. Julien P. Friez & Sons, Inc., Baltimore, Md. Illustrated catalog listing complete line of instruments for measuring and recording outdoor weather conditions; for automatic control, indication, and recording of temperature, humidity, etc., of indoor air conditions; air meters for measuring pressures and velocities; electrical running time or operation recorders; etc.

Variable-Speed Transmission. Reeves Pulley Co., Columbus, Ind. "Speed-Control Handbook" of over 100 pages giving detailed information on applications, advantages, and construction of Reeves variable-speed units; engineering data of value in selection and installation of proper units for specific requirements, etc.

Activin. American Aniline Products, Inc., 50 Union Square, New York. Folder showing by photomicrographs action of Activin-S in solubilizing starch in sizing and finishing.

Testing. United States Testing Co., Inc., 1415 Park Ave., Hoboken, N. J. Price list of physical and chemical tests.

Silicates. Philadelphia Quartz Co., Philadelphia. Booklet discussing use of sodium silicate for treating concrete.

Dyes. General Dyestuff Corp., 230 Fifth Ave., New York. Color card showing full range of Algosol dyes.

Flexible Couplings. John Waldron Corp., New Brunswick, N. J. Catalog of Francke flexible coupling, describing recent changes in design, tables of sizes for various types, directions for size selection, etc.

Belting. Graton & Knight Co., Worcester, Mass. Performance book giving results of case studies on performance of Research leather belting in textile mills and other plants.

Warp Sizing. Charles B. Johnson, Paterson, N. J. July-August issue of *Rayon Warp Sizing Specialist* containing articles on sizing from dyer's and printer's viewpoint and on new Johnson warp conditioner.

Trucks. B. F. Goodrich Co., Akron, Ohio. Booklet devoted to pneumatic tires for wheelbarrows and industrial trucks.

Spray Painting. Binks Mfg. Co., 3114 Carroll Ave., Chicago. Revised catalog devoted to spray painting equipment and accessories. Includes chart explaining the correct nozzle setups for different classes of paints.

Uniforms. Angelica Jacket Co., 104 W. 48th St., New York. Bulletin describing line of washable uniforms for industrial personnel.

Combustion Control. Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland, Ohio. Illustrated 32-page bulletin, No. 102, describing a complete combustion-control system designed to maintain automatically steam pressure, combustion efficiency and furnace draft.

Gate Valves. Lunkenheimer Co., Cincinnati, Ohio. Circular No. 504 describing and listing complete line of King-clip gate valves.

Variable-Speed Transmission. New Departure Mfg. Co., Bristol, Conn. Catalog containing description, specifications, and engineering data relative to the variable-speed Transitorgue.

Alkali. J. B. Ford Co., Wyandotte, Mich. Tabloid newspaper now being sent to 130,000 customers and prospects in the interest of Wyandotte products.

Leather and Preservatives. E. F. Houghton & Co., 240 W. Somerset St., Philadelphia. Booklet describing all types of textile leathers including belting, spindle belts, round belts, loom leathers, leather aprons, etc. Contains data on proper selection and application.

Generators. Allis-Chalmers Mfg. Co., Milwaukee, Wis. Leflet 2202 describing Syncro-Operator, an automatic device designed to synchronize generators operating in parallel.

Twisters. Davis & Furber Machine Co., North Andover, Mass. Illustrated 40-page catalog describing plain and novelty twisters and giving directions for making loop, knop, covering, core, etc., for basic types of novelty yarns.

New Publications

New Courts of Industry, by Louis Nizer. The Longacre Press, Inc., New York. $5.00.

Although this is a study of self-regulation under the motion-picture code, Mr. Nizer's work has a greater significance than that attaching to a book which is merely useful to a special industry. It is, in effect a commentary upon NRA activity and as such should be of interest to other industries which were involved in NRA procedure during the life of that experiment.

This book is described as the first scientific treatise of the actual operation of a code. The subject is treated in an impartial and judicial manner. The author gives critical comment and suggestion as well as record of achievement. The work outlines the actual experiences of the industry under its code over a full year of operation; points out the problems presented and the approach made to those problems; and illustrates and analyzes the solutions reached.

Cost Manual of the Carpet and Rug Industry; 1935; Institute Carpet Manufacturers of America, New York; $7.50.

This manual was developed by the Carpet Institute early this year and is notable because of the adaptability of the principles and procedures described in it to various types of businesses in the industry. Following introductory sections dealing with a classification of accounts and the general procedure for obtaining material, labor and overhead costs, the cost estimating procedure adopted by the Industry for Code purposes is presented. Then follows a section explaining how this cost estimating procedure can be used for obtaining actual costs. The last section of the manual is a further elaboration of the preceding sections and describes the extension of the cost plan to include standard costs. Thus the individual business can go as far as it wants in applying the principles, and does not need to discard the work which has already been done in advancing from estimated costs to actual costs, or from actual costs to standard costs. The manual contains a number of illustrative forms.

Vegetable Dyes, 5th Edition; by Ethel M. Mairet; Bruce Humphries, Inc., Boston, Mass.; Price $2.

"This book of recipes and other valuable information," say the publishers, "should be in the library of every firm producing dyes or using dyes in connection with wool, silk, linen, and cotton." Your reviewer concurs in this opinion, although his reason for this belief undoubtedly is different. Our readers may not get much information of value from such statements as: "Rain water should be collected as much as possible, as this is the best water to use [for dyeing]." They cannot fail, however, to be interested in reading of the many vegetable dyes and the methods of applying them which were in use in bygone centuries and which survive to-day mainly in the handicraft industries.

Business News

Terrell Machine Co., Charlotte, N. C., announces revised territories for its salesmen, effective Aug. 1. J. J. Wilson, Jr., with headquarters at Greenville, S. C., has been transferred to Charlotte, from which point he is covering Virginia, Eastern North Carolina and Eastern South Carolina. W. S. Terrell, with headquarters at Atlanta, Ga., has been transferred to Greenville, S. C., from where he is covering Western North Carolina, Georgia, Alabama and Eastern Tennessee. A. C. Kimbirl, with headquarters at Charlotte, is traveling both territories, and, in addition to performing general sales work, will be in charge of installations and service work.

Mill Devices Co., Inc., Gastonia, N. C., in addition to manufacturing and selling Boyce weavers' knotters, has developed a new service, known as Experimental Engineering Department. This department is designed to assist inventors develop new devices, and to cooperate with industrial plants in making special small parts, dies, castings, nuts, screws, etc. The management points out that the company is well equipped with the latest machines for this type of work and employs only the most experienced machinists.

Borne Scrymser Co. has placed its Breton Minerol Process for conditioning dyed cotton in the Salisbury (N. C.) Cotton Mills, Erwin Cotton Mills, Cooleemee, N. C., and Mauney Mills, Inc., King's Mountain, N. C.

Commercial Factors Corp., with main office at 2 Park Avenue, New York, has taken new branch office space at 77 Franklin Street, Boston, Mass. The new office will continue under the direction of Eugene G. Lynch, New England representative, who is well known in mill and industrial circles.

Hall Laboratories, Inc., Pittsburgh, has made Dr. Everett P. Partridge director of research.

Atwood Machine Co., Stonington, Conn., has sent Harold J. Morton to England and the Continent for a trip of six months or more so that he may contact and advise plants using Atwood equipment.

General Aniline Works has started construction on a four-story building to cost $100,000 at Rensselaer, N. Y.

Universal Power Corp., Cleveland, O., has appointed W. S. Murphy, P. O. Box 485, Charlotte, N. C., representative for North Carolina and South Carolina to distribute arc-welding equipment, accessories and electros.

General Electric Co. has appointed Nelson J. Darling, manager of the River Works of the company, Lynn, Mass., also as manager of the West Lynn (Mass.) Works. F. P. Cox, recently manager of the latter works, has retired after 45 years with the company.

Root Chemical Co., Norwich, Conn., has been chartered to manufacture chemicals for bleaching purposes. Louis C. Root of Norwich is president and treasurer; Elizabeth M. Broadhurst of Norwich, vice-president, and Evon B. Griswold, New London, secretary. Authorized capital is $50,000, with $1,000 paid in. Offices are at 135 West Thames Street.

L. H. Gilmer Co., Tacony, Philadelphia, announces the appointment of William W. Conrad as southern representative with headquarters at 95 Pine St., Atlanta, Ga. He will cover North and South Carolina, northern Georgia and Alabama, and eastern Tennessee.

Carolina Specialty Co., Charlotte, N. C., is now representing Sholes, Inc., 50 Church St., New York, and Orange, N. J.

TEXTILE WORLD ANALYST

An object-lesson in sane price policy

Textile mill activity during the first seven months of the year did its best to live up to the prophecy we made at the beginning of the year. We predicted then that 1935 activity would be at least 10% above 1934—and the January-July level was exactly that. Preliminary estimates, subject to revision when statistics become available, indicate that at least this percentage increase over the previous year was carried on through August . . . . Fortunately, maintained activity has been accompanied recently by price firmness. The combination, plus expanding demand which is now making itself evident, means good prospects for textiles this fall.

TABLE I is Exhibit A this month. It tells an extremely important story. Although its data are confined to cotton goods, its moral extends to every branch of the textile industry.

It shows manufacturing margins on carded cotton fabrics from August, 1933, the first full month of operation under the code, through August, 1935. As readers of this page know, this margin is the difference between the average selling-price of a group of representative fabrics and the price of clean cotton (including the processing tax, of course). This difference is comparable for the period under review in the table, since wages and other major costs have not changed to any marked degree during that period.

August, 1935, is the star performer. Coming on the heels of the disgraceful month of July, when this margin dropped to the lowest point since comparable records have been available, August witnessed a come-back to such an extent that the average margin for the month was the highest since October, 1934. Parenthetically, it might be added that October, 1934, was during the period when, according to the Federal Trade Commission, the entire textile industry lost money. Consequently, the consumer does not need to worry as yet about being gouged.

The striking feature of the improvement in carded fabric margins during August was that it developed in the face of a declining raw material market. Two events occurred which had a bearish effect on cotton: the Government's preliminary crop estimate which was in excess of private estimates, and the substitution of a 10c. loan plus bounty for the former 12c. loan.

Too often in the past this combination of circumstances would have demoralized the goods market and forced already profitless prices to still lower levels. But not this time. A new type of leadership presented itself and the market as a whole promptly rallied around it. Not only was the possibility of declines checked, but actual advances were announced.

In other words, it was just as if the industry finally rose up in its wrath and said to buyers: "We're tired of selling our goods at a loss; if you want them, you've got to give us a chance at least to break even." And, although present prices are still not too profitable, they are a step in the right direction.

Altogether, this was the most encouraging development that we have noted on this difficult problem of price policy for a long, long time.

Incidentally, it may be noted in Table II that the margin in carded yarns did not show so sharp a jump. However the fact that a 1c. gain was made in the margin despite the raw cotton decline, reflects increased sanity in this branch of the market also.

Cotton is not the only division of textiles to reflect strength. In fact, practically all branches are on the up-and-up. Wool consumption is running at the higest rate since the war year 1918, and new lines have beeen opened at advances. Raw silk has made a spectacular come-back in price. Rayon prices have advanced; production promises to set another new record this year. The knit goods industry, in all its branches, is strong.

TEXTILE WORLD's price index numbers, shown on this page, reflect the sharp rise in raw silk which featured price movements for the month of August. At 37, the silk index is now at its highest point since October, 1933, and the September figure will be considerably higher if the prices prevailing at the end of August continue in effect. In the cotton group, the yarn and cloth indices held up in the face of a declining raw material price. Wool prices were steady during the month.

TABLE I. CARDED FABRIC MARGIN

Date	Margin in cents	Date	Margin in cents
August, 1933....	21.4	March, 1935....	15.9
October, 1933...	19.1	April, 1935.....	16.1
January, 1934...	18.4	May, 1935.....	16.0
April, 1934.....	17.6	June, 1935.....	16.5
July, 1934.....	15.5	July, 1935.....	15.2
August, 1934....	16.6	August.....	17.1
September, 1934	18.6	Aug 7.....	15.7
October, 1934...	17.4	Aug 14.....	16.9
November 1934.	15.8	Aug. 21.....	16.7
December, 1934	16.2	Aug. 28.....	17.6
January, 1935..	16.2	Sept. 4....	18.4
February, 1935..	16.0		

TABLE II. CARDED YARN MARGIN

Date	Margin in cents	Date	Margin in cents
August, 1933....	23.5	March, 1935....	14.4
October, 1933...	20.0	April, 1935.....	14.1
January, 1934...	18.3	May, 1935.....	13.8
April, 1934.....	15.9	June, 1935.....	14.5
July, 1934.....	14.7	July, 1935.....	14.3
August, 1934....	15.3	August, 1935....	15.3
September, 1934.	15.6	Aug. 7.....	15.1
October, 1934 ..	14.6	Aug. 14.....	15.5
November, 1934.	13.5	Aug. 21.....	15.4
December, 1934.	13.5	Aug. 28.....	15.2
January, 1935...	13.5	Sept. 4....	15.5
February, 1935..	13.9		

▼ ▼ ▼

Textile World's Price Index Numbers

Date	Cotton Index Numbers: Cotton	Yarns	Gray	Colored	Wool Index Numbers: Wool	Tops	Yarns	Cloth	Silk Index: Raw Silk
July 31, 1914..	100	100	100	100	100	100	100	100	100
1932, average..	51	76	73	100	78	97	115	128	34
1933, " ..	84	116	110	113	116	135	139	181	35
1934, " ..	132	142	139	141	138	159	167	206	28
Jan. 1935.....	135	138	137	140	124	132	154	190	32
Feb. 1935.....	134	138	136	140	116	124	152	190	31
Mar. 1935....	127	136	134	139	108	118	148	190	29
Apr. 1935.....	127	135	131	138	105	114	148	190	30
May 1935.....	132	137	133	139	108	116	150	200	30
June 1935.....	128	138	133	139	123	135	155	200	30
July 1935.....	131	140	130	139	123	135	155	200	33
Aug. 1935....	125	139	131	139	123	135	155	200	37

Note: All cotton indices since Aug. 1, 1933, include processing tax.

TEXTILE WORLD'S

Cotton Digest

W. RAY BELL, president of the Association of Cotton Textile Merchants of New York, paints a picture which makes us still more confident about our "prophecy" in the leading editorial in this issue.

Authentic reports from all over the country, he advises his members, reflect the extraordinary retail sales and depletion of retail stocks. Tremendous sales volume is reported by distributing agencies among which are represented several of the largest buyers of cotton products. . . . In sharp contrast with this revival of demand, he continues, cotton goods production has been sharply curtailed and surplus stocks are practically negligible due to refusal to maintain operations at the current levels of price.

In other words, the deck is cleared for action.—*Editor.*

Cotton Loan Cuts Capers

Washington, the master magician, pulled two rabbits out of the cotton-loan hat last month. The first rabbit knocked the trade off its feet with announcement of a 9c. loan to farmers instead of the expected 12c. loan. Manufacturers, shippers and merchants applauded loudly, but farmers and southern politicians hissed them down. In fact, so much hissing took place that the Master Magician quickly grabbed for his hat and plucked forth a second rabbit—a 10c. loan!

The original plan was for AAA to take the average price of cotton (⅞ in. middling) on 10 designated spot markets from Sept. 1 to Jan. 1 and pay producers a subsidy equal to the difference between that figure and 12c. Cotton States senators objected that, under this plan, contract (production control) signers would be enabled to secure a loan on all their cotton, including that produced in excess of the Bankhead allotment. Also, it was asserted that some producers would receive more than 12c. while others would receive less than 12c.

Under the latest plan, the Government will lend 10c. on cotton of stipulated quality produced under the Bankhead allotment by signers of the control contract. A subsidy will be paid equal to the difference between the average price of cotton on the ten designated spot markets and 12c., the average to be taken on the day of sale. The farmer will receive a check as soon as this average is calculated; whereas, in the original plan he would not have been paid until after the first of next year. Adjustment payments will be made through Aug. 1, 1936. An enormous amount of bookkeeping is expected in connection with this new plan.

•

Japanese Exports

Exports of Japanese cotton cloth during the first half of 1935 amounted to 1,364,001,387 yd., some 120,411,380 yd. more than exported during the same period the previous year.

•

AAA Fortified Against Supreme Court?

Six months after its simultaneous introduction in the Senate and in the House, and after much haggling among committees, the complex bill amending AAA was signed by the President. Broadly speaking, the bill is designed (1) to insure constitutionality in the light of Supreme Court decisions, and (2) to strengthen, clarify and correct the farm program in the light of experience gained since its inception.

Three moves were made to insure constitutionality:

1. The authority of the Secretary of Agriculture is defined and limited in great detail in order to make it clear that Congress is not delegating legislative powers to an administrative officer.
2. The operation of the Act is rigidly limited to interstate commerce, and the interstate commerce clause is redefined to bring it in line with language previously used by the Supreme Court. Definite provision is made for the cooperation of Federal and State governments where necessary in order to make a program effective.
3. All previous and existing taxes, benefit payments and contracts instituted prior to the adoption of the amendment, are legalized and ratified by Congress.

Nine changes were made to strengthen and clarify the farm program. Included are amendments to the Bankhead Act and to provisions of AAA dealing with cotton option contracts and the cotton pool.

•

Bullish Crop Forecast

Still another boost for an already buoyant cotton industry was furnished Sept. 9 when the Government report indicated a crop of 11,489,000 bales as of Sept. 1, a drop of 309,000 bales from the previous forecast of 11,798,000 for the crop as of Aug. 1.

Business Better! —Thomas Webb

Reports from Washington that the Works Progress Administration will purchase 150,000,000 yd. cotton textiles over a period of six or eight months should produce a firm and permanent tone in the cotton textile goods market, according to Thomas H. Webb, president of the American Cotton Manufacturers Association. He said that the market already is showing a firmness, and, in many instances, a rise, due to the fact that the mills had an opportunity to shift into better positions during the period of hesitancy and doubt pending certain Governmental actions and announcements.

•

Yarns Rise Slowly

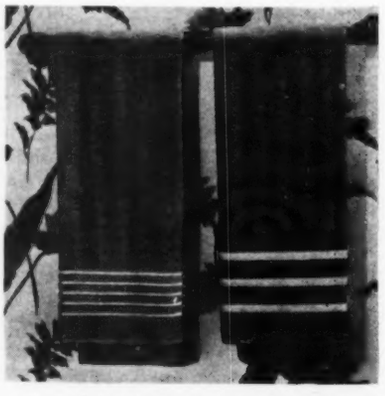
Cotton yarns shared the strengthening trend of textiles but to more moderate degree than some other branches. Prices at the end of August were generally firmer than at the end of July. Demand is active but mostly for spot or two-months delivery; the chief call came from the knitted outerwear market, underwear mills bought spottily and a pick-up at that end was hoped for later this month.

•

Strong Goods Rise Finds Buyers Eager

Probably the most significant phase of the August advances in cotton goods quotations was that they were followed by steady buying, and the market entered September with demand unimpaired. There were two upward movements during the month, these reflecting the determination of the industry's leaders to insist on healthier levels.

On Aug. 9 an advance of 5% was announced. This had a tonic effect on the market which further improved when a second 5% advance was made on Aug. 28. Since raw cotton had changed little, it



Smart simplicity is the keynote of the newest Fall fashions in towels, from the looms of the Cannon Mills. Cannon's latest innovation is the introduction of alternating stripes of spun rayon and cotton terry in two new styles—"CLASSIQUE" which features five narrow white border stripes, and "RENDEVOUS" with wide white stripes, touched with black. The spun rayon adds much to the beauty and all round serviceability of these unusually absorbent towels. "CLASSIQUE" and "RENDEVOUS" come in Peach, Maize, Jade and Blue. They will retail for about $1.50.

was clear that initiative within the industry caused the rise. However, demand also was a factor as many customers who had delayed buying found themselves facing fall with virtually no stocks, and therefore were compelled to purchase without further delay.

•

Cottons Drive Toward Men's Summer Clothing

Cotton goods have been given a big push toward a position of importance in men's summer clothing. Recent openings by converters and mill agents of printed and yarn-dyed fabrics, disclose styles more cleverly and effectively designed than ever before for the men's wear niche. Gabardines, sateens and cords in white and solid colors are also important. Slacks are expected to repeat their success of last season and suits of cotton are expected to make a larger impress. Cords are priced from 22 to 30c.; seersuckers, 15 to 30c.; all-over prints, 16½ to 21c.; spun rayon and other mixtures, 35 to 75c. and higher; gabardines, 36½ to 52c.; woven designs, 25 to 30c.

•

July Operations

Statistics of particular interest to cotton manufacturers, showing July operations and the raw material situation, were:

Spindle activity	73.5% capacity, or 5,157,527,985 spindle hours
Cotton consumed	391,771 bales
Cotton exported	276,622 bales
Cotton imported	6,707 bales
Cotton ginned to Aug. 1	94,241 bales
Estimated yield (Aug. 8)	11,798,000 bales

June operations for comparison:

Spindle activity	74.6% capacity, or 5,083,383,303 spindle hours
Cotton consumed	385,946 bales
Cotton exported	344,955 bales
Cotton imported	6,403 bales

•

Cotton Industry Notes

Double-Barreled Sheets — Bed sheets are natural twins and should be sold in pairs instead of singly, declare the makers of Chatham "specification" sheets. A special package, designed to hold two sheets in transparent cellulose wrapping, has been adopted.

Japanese cotton weavers and exporters have decided to restrict exports to the Philippines, based on the 1934 figures of 56,000,000 sq.m., irrespective of agreement on the part of American textile interests. This decision was reached at a joint conference of the Japan Cotton Spinners Association and the Export Cotton Yarn and Textile Dealers Association, and immediately telegraphed to the Japanese Ambassador to the United States.

Work Progress Administration will buy 150,000,000 yd. of cotton textiles according to its sewing-room projects in various parts of the country. The first portion of the total will be bought about Oct. 15 and will cover some 10,000,000 yds.

PLAIN TALK

"During the past winter a great deal was said, and even more written, about the industrial problems of New England and the inability of its manufacturers to compete with those of some other sections of the country in the production of cotton textiles. It is certain that they cannot compete indefinitely unless the total costs, including labor, are on a competitive basis. The solution of the problem lies with the people of New England. If it costs more to produce a yard of the same cloth in Maine than it does in the South, then, eventually, the goods will be produced in the South. This is economics and not politics. No political harangues can alter the facts nor postpone for long the operation of this principle. And the producers in the low-cost areas of the South will not raise their own costs in order to rehabilitate the marginal producer or to gratify New England sentiment. . . .

"The costs of production in New England must be kept in line with the costs of competing districts in the South or the New England mills are doomed."—RUSSELL H. LEONARD, president and treasurer, Pepperell Mfg. Co., in his report to stock-holders.

COTTON IN THIS ISSUE

	page
Delivery Dates—Avoiding Conflict with Selling Office	84
Death at Pelzer	87
Logic—A Drama in One Act	88
Avoiding Knots and Loose Ends in Seersuckers	89
What Staple to Afford Good-Running Yarn	91
Colored Oil Places Responsibility for Oil Stains	92
Promising Polo Shirt Constructions for 1936	106
Rayon Staple Must Stand on Own Merits in U. S.	107
Leno Ends Bunched	124
Mercerized Yarn Lacks Luster	124
Twist Take-Up	125
Cotton Bags	125
Sewing Machine for Bulky Fabrics	128
Seamless Cork Cot and Assembly Devices	128
Roll Covering	129

Cotton Financial Notes

Consolidated Textile Corp. reports consolidated net loss for first six months of 1935 of $470,473.

Sagamore Mfg. Co., Fall River, Mass., started up Sept. 4 for a six weeks run. If business does not improve the directors will consider liquidation.

Peck Mfg. Co., Warrenton, N. C., was declared insolvent by U. S. Court and ordered to be liquidated. Creditors of the company had disagreed on a plan of reorganization under Section 77-B of the Federal bankruptcy act.

Chesnee (S. C.) Mills, operated under direction of John A. Law, receiver, are arranging for reorganization. Negotiations are being concluded for an RFC loan of $275,000.

Victor Monaghan Co., Greenville, S. C., reported for fiscal year ended June 30, 1935, a manufacturing profit of $75,244, but, after deductions, a net loss of $87,722. This compares with a net profit in the preceding year of $451,718.

Pelham (S. C.) Mills—Henry T. Crigler, president, has been appointed receiver for this company in bond of $30,000.

Wabasso Cottons, Ltd., Three Rivers, Que., reports earnings to be $60,000 higher at $872,082, for the fiscal period ended June 29, 1935.

Lockwood Co., Waterville, Me., is seeking an abatement of taxes, refusal of which may mean liquidation. The mill has closed for several weeks and repairs have been under way.

Berkshire Fine Spinning Associates, Inc., are running out stock in process in Plant B, Fall River, Mass., preparatory to liquidation. This mill was one of the former Parker Mills, known as the "lawn mill," comprising 55,000 spindles and 1,000 looms.

Cotton Mill News

West Boylston Mfg. Co., Montgomery, Ala., has begun superstructure for new one-story addition, to be used for expansion in slasher division. It will cost over $25,000, including equipment. General contract was let to Batson-Cook Co., West Point, Ga. Robert & Co., Atlanta, Ga., are the engineers.

Georgia-Kincaid Mill No. 2, Griffin, Ga., has junked its old-model speeders and replaced them with Woonsocket equipment. Old drawing frames have been replaced with Whitin frames in Mills Nos. 2 and 3.

Ludlow (Mass.) Mfg. Associates have plans under way for a new mill on tract of about 53 acres of waterfront property, recently bought from Edgemoor Iron Co. at Wilmington, Del. Main unit will be two-story, 400 x 600 ft., with several smaller adjoining buildings, power house and auxiliary structures. Plant will cost in excess of $1,500,000.

Whittenton Mfg. Co., Taunton, Mass., has approved plans for complete modernization of local mills. Several divisions will be concentrated and much machinery sold. New long-draft spinning equipment, single-process pickers and other machinery will be installed.

Phenix Mills Co., Kings Mountain, N. C., has completed installation of 130 Model XK 44-in. Draper looms, replacing older equipment.

Salisbury (N. C.) **Cotton Mills** is installing a Morrison Sanforizing machine and a package-dyeing machine purchased from H. W. Butterworth & Sons.

Waldensian Weavers, Inc., Valdese, N. C.—Mill of this company has been acquired by A. Alexander Shuford, Jr., treasurer of the A. A. Shuford Mill Co., Hickory, N. C., and associates.

Jackson Mills, Wellford, S. C., have work under way on reconditioning and improving of its new No. 3 mill at High Shoals, N. C., formerly the property of Manville-Jenckes Corp.

Texas Prison Board, Houston, Tex., is proposing to set up a cotton mill costing $85,000 for use in rehabilitating first-term prisoners.

Sherman (Tex.) **Mfg. Co.** has installed 78 automatic looms to replace plain.

TEXTILE WORLD'S

Wool Digest

WE don't see much room for argument in this matter of selling-terms in the women's wear field.

The chaos of pre-code days, when terms were set by a sort of poker game between buyer and seller, was replaced 18 months ago by a standard practice which has contributed tremendously to the soundness of the market. After the code expired, via the Supreme Court, the coat and suit industry brought pressure to bear for a return—not to the old terms, for there really weren't any—but to the chaos of the old days.

The prompt action of wool manufacturers in rejecting, by an overwhelming majority, the demands of the buyers, is heartening to those who have not always seen such firmness in past dealings with customers.

Credit goes to the National Association of Wool Manufacturers which gave the industry an opportunity to articulate its attitude in this matter. Arthur Besse's words should be kept in mind: "I sincerely hope that members of this industry will scrupulously maintain present practices and will not under any circumstances yield to ill-considered demands which, if acceded to, would produce unfortunate confusion and chaos in the market."

—*Editor.*

Industry Rallies to Maintain Terms

Selling terms were much in the forefront of wool goods news during the last few weeks. Buyers have from the first fought the shorting of the time allowed for discounting their bills, and they have lately been trying to take advantage of the cessation of NRA to force the industry back to the loose, irregular practices of pre-NRA days when discounts were often subjects of trading, and long extension of credit made the primary market the virtual financiers of the cutting trades.

Under NRA, selling rules were set up for the various branches of wool manufacture and maximum terms on fabrics were placed at 1% 10 days, net 60 days from date of invoice or shipment whichever is earlier. The old discounts ran up to 10% and 60 days extra for net payment was often added for good measure. The NRA uniform sales contract and terms became effective on April 30, 1934. They were subjected to hearings at which all arguments were aired and they had the approval of the NRA administrator for a month before their effective date.

Clothiers have been pushing to get broader terms, but without success; and also attacking the f.o.b. mill provision.

On Aug. 28 representatives of leading sellers of women's wear met in New York in response to pressure from the Industrial Council of Cloak, Suit and Skirt Manufacturers. Opinion was expressed that buyers were short-sighted in trying to break down the standardized practices of the industry from which they buy their merchandise. All concerns on primary market, excepting three, indicated that they planned to adhere to the standard practices including terms and the f.o.b. provision. Of those three the Forstmann Woolen Co. was named as the most important. That firm stated that it would restore the former terms beginning with the coming spring season. It also stated that delivery charges on goods transported on its own trucks from the mill in Passaic, N. J., to New York City were discontinued as of Aug. 28, 1935.

It is said that men's wear mills have been holding to the uniform selling terms without a break.

•

Men's Wear Trends Upward

After the summer dullness, broken by the offering of tropicals last month, the men's wear market is moving forward into the spring, 1936, season with activity and enthusiasm. Opening of regular suiting lines was made informally in several quarters before the end of August due to the presence of out-of-town buyers and their evident interest in new lines. Prices are reported to average 10c. per yard over the previous season and several lines were advanced another 2½c. shortly after opening.

The tropical worsted business for 1936 has been large, some factors estimating it as 25 to 30% over that of a year ago at this time. There has been great interest in gabardines for spring and summer clothing and a large business has been done. Prices have been raised 2½ to 5c. since opening in early August.

Indications are that worsteds will be important for 1936 and that mixtures will be the most active classification. Buyers have not yet closed their complete initial business, since in early September not all lines had been shown and clothiers desire to make full comparisons before signing up on definite business. However, authorities estimate that business on books of men's wear mills at the end of August was equivalent to 2½ months of mill operation. The outlook is for a considerable increase in advance business as openings for spring are completed this month.

Despite the rise in fabrics it is understood that clothiers will continue their existing price ranges on men's clothing. There will be greater care than ever before in styling popular priced garments from $18 to $25.

•

Fall Women's Wear Still Active

Women's wear woolens and worsteds promise to be active for fall through the current month. Buyers have taken the season slowly and at this late date are believed to have a considerable yardage yet to buy. Increased sale of wool coatings is developing as retail sales of fall garments get under way. Friezes and suede type fabrics have been popular for women's coats and fancy fleeces for suits and sports garments.

•

Want Top Standards Based on Domestic Wool

A recommendation that domestic wools be used in the preparation of the official top classification standards has been made to the U. S. Department of Agriculture by the Sub-Committee on Wool and Its Products, a division of Committee D-13, the textile committee of the American Society for Testing Materials. This recommendation has been made with the sanction of the National Association of Wool Manufacturers, which assisted the Department of Agriculture in the development of the present standards at the time imported fiber exceeded the consumption of domestic fiber.

Among the arguments offered in favor of the change are that certain Government orders specify the use of domestic wool and that the correlation of the Government standards with the subcommittee's studies on the determination of fineness, length, crimp, and other physical characteristics of the fiber is handicapped by the fact that foreign wools are used in the former.

In acknowledging receipt of the recommendations to G. E. Hopkins, of Bigelow-Sanford Carpet Co., Thompsonville, Conn., chairman of the Sub-Committee, C. V. Whalin, in charge of the Livestock, Meats and Wool Division of the Department of Agriculture, pointed out that the change, although contemplated for some time, has been delayed by the difficulty in securing domestic top samples of the exact character needed and by a rather limited budget. Mr. Whalin added, however, "With the general interest that is being manifested and the generous cooperation that is being extended, we hope the objectives can be attained."

Tops Gain in Strength

Wool tops showed improved strength as the month of August advanced. Futures moved gradually into new high ground for the year and volume of trading in the middle of the month was large. It quieted toward the close but prices held firm. Spots on the top exchange ranged from 88c. for the first three weeks of the month to 89½c. on Aug. 30. The spot high for the first eight months was 90c., touched July 5. Interest in futures centered on the winter and spring months.

•

Reworks Slow but Firm

Wool substitutes increased in strength through August. Although graders were trying to obtain concessions on mixed rags, they were firm in their own quotations on graded materials. Demand has been slow but there is general optimism through the market that the rising trend of virgin wool will render reworks more sought after by mill men in an effort to hold down the cost of popular priced woolens.

Mixed softs were at 11 to 11½c. at the end of the month and coarse light merinos (free of black) were at 11½ to 12c. In new graded clips fine Botany worsteds were at 34c. and No. 1 fine mixed clips at 21c. In new sweater clips fine white commanded 53 to 55c.

The current war threat in Europe and elsewhere is a factor which is not to be overlooked among current influences tending to strengthen the wool substitutes market.

•

Activity of Industry

Current statistics on wool consumption and mill activity follow, the activity percentage being based on single 40-hour shift, 5 days per week. July consumption four weeks and June five.

Wool consumed:	June	July
Total clean equiv. (excluding carpet)	26,585,000	23,575,000
Carpet wool (grease)	10,245,000	11,329,000
Looms (50" wider).	97.3%	97.9%
Carpet looms	62.9%	66.2%
Combs	142.3%	127.7%
Worsted spindles	89.7%	83.4%
Woolen spindles	114.3%	120.7%

•

Industry Briefs

Two Unions in Plant: Into the Uxbridge Worsted Co. labor situation has come a new union, the Independent League of Textile Workers. This was organized at the Pascoag plant by Joseph M. Lariviere, at one time active in the U.T.W. This body claims to represent a majority of the workers at the Pascoag plant. It is planning to extend its scope of activity to other plants of the company.

Webster Strike Settled: American Woolen Co.'s Webster (Mass.) Mill workers voted to accept the recommendations of the State Board of Conciliation and Arbitration, but further steps were necessary before reopening of the mill.

Samuel Hird & Sons have priced range 612 for spring 1936 at $1.42½ (10c. up from fall and 15c. over a year ago). Range 400 is now $1.52½ and range 5000 is $1.75. Fancy weaves are 2½c. extra and decorations 5 to 7½c. extra.

Woolen Mill Overseers' Association met at Sandy Beach, Me., for the annual business session and outing. John R. Garrity, of Pittsfield, was elected president; John D. Richards, of Dexter, first vice-president; James Halliday, of Oakland, second vice-president, and Lewis B. Sands, of Newport, secretary-treasurer.

Connecticut Woolen & Worsted Manufacturers' Association will enter an exhibit in the forthcoming Connecticut Tercentenary Industrial Exposition, scheduled Oct. 2 to 12 in the State Armory, Hartford.

"Imitation is the sincerest form of flattery, BUT . . . " This is the opening sentence of a folder recently issued by Associated Wool Industries calling attention to misrepresentation and urging members to capitalize the superiority of wool by properly marking all piece goods tickets and otherwise.

•

Wool Financial Notes

American Woolen Co. reports a net profit of $501,015 for first six months of 1935, against a net loss of $585,020 for similar period in 1934.

Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn., reports a net loss of $320,582 for six months ending June 30, compared with a net profit of $214,891 for the corresponding period last year.

Chicago Chenille Rug Mills, Inc., 2309 South Keeler Ave., Chicago, Ill., have been formed with capital of 100 shares of stock, no par value, to operate a local mill. The incorporators include William Haynie and O. W. Fremer.

Windsor Carpet Co., Franklin, Mass., is in hands of Arthur J. Young, Worcester, as receiver. Plant is closed.

Hillsboro (N. H.) Woolen Mill Co. has closed for an indefinite period, said to be due to lack of new business. The mill has been giving employment to about 200.

Springfield (Tenn.) Woolen Mills Co. will increase capital stock from $50,000 to $100,000. Mayor John E. Garner of Springfield has been elected president; C. H. Rickman, vice-president; Chas. F. Bell, second vice-president, E. B. Boyd, secretary and general manager; W. Harry Elam, treasurer.

Bridgewater (Vt.) Woolen Co., in the hands of Robert M. Sharpe, as receiver, made net gain for the second quarter of the year of $3,998.

Suit has been brought against eight officers and directors of the American Woolen Co. by Albert Lautman, an investment counsellor and stockholder, demanding an accounting for salaries and bonuses.

Voluntary petition for reorganization under Section 77b has been filed by Botany Consolidated Mills, Passaic, N. J. Equity receivers were appointed by the Court as temporary trustees. These are C. F. H. Johnson, H. C. Whitehead, H. Meyers, and H. L. Bahnsen. The situation is complicated by suits of various bondholders. One bondholder has brought suit against the Chase National Bank as trustee for permitting an RFC loan allegedly without consent of two-thirds of the bondholders who thus became second-mortgage holders instead of first.

WOOL IN THIS ISSUE

	page
Must We Move South? Asks the Wool Industry	86
Worsted Mills Simplify Drawing Process	90
Rayon Staple Must Stand on Own Merits in U. S.	107
Institute Initiates Plans to Improve Carpet Position	120
Keeping Records of Experimental Fabrics	121
Nep Yarn	125
Sewing Machine for Bulky Fabrics	128

Wool Mill News

Atlanta (Ga.) **Woolen Mills** has erected a one-story addition and completed alterations and repairs to the main part of the mill.

American Woolen Co., North Vassalboro, Me., is erecting a new dyehouse at local mill to replace old structure.

Ware (Mass.) **Woolen Co.** has awarded contract to A. L. Phelps, Inc., 496 Bridge St., Springfield, for a one- and two-story addition with 7,000 sq.ft. floor space. Harrison G. White, of Springfield, is the engineer.

American Woolen Co., Webster, Mass., recently sustained a fire loss at local mill totaling about $25,000. The damage will be replaced.

Dartmouth Woolen Mills, Inc., Claremont, N. H., plan rebuilding of portion of raw material storage buildings, recently damaged by fire.

F. C. Huyck & Sons, Rensselear, N. Y., has under way construction of two large warehouses at a cost of $44,000.

Warrensburg (N. Y.) **Woolen Mill,** recently leased to Eugene Karr, of New York City, is producing women's wear fabrics and woolen cloth with 40 workers.

Waterloo (N. Y.) **Mills, Inc.,** have been acquired by new interests headed by Allen L. Goldfine, 450 Seventh Ave., New York, N. Y., which will take over property at once. Mill will be reconditioned and improved, and additional machinery installed.

Alexander Smith & Sons Carpet Co., Yonkers, N. Y., is considering new one-story mill addition on Nepperhan Ave., to be used primarily for finishing plant expansion. It is estimated to cost over $40,000, with equipment.

Pearson & Bayman, 54th and Poplar Sts., Philadelphia, have started up a worsted yarn business comprising drawing, spinning, winding, reeling, and jack spooling. The firm offers weaving and knitting yarn in white and colors. Frank Pearson was formerly superintendent of Sheble & Wood, Salamanca, N. Y., and Wm. T. Bayman was superintendent for Andrew Y. Michie & Sons, Philadelphia.

Normandie Mfg. Co., Woonsocket, R. I., recently organized, has leased part of former local Alice mill of the United States Rubber Co. and will remodel and equip at once for new plant for twisting on special machinery of novelty cotton, rayon and woolen yarns for women's wear. Facilities will be provided for employment of about 100 persons. It is expected to have mill ready this month. Edward Dauray is president. French capital is said to be interested.

TEXTILE WORLD'S

Rayon Digest

OUR Rayon Number appears under most auspicious circumstances this year. Not only is a new production record to be set, but the recent price advance probably means that the expanded output will be sold at a profit by the yarn producers, and handled more profitably by the fabricators. And that, after all, is a pleasant side of business—when it happens.

Next year, rayon production in this country will celebrate its silver anniversary. And what a quarter-century! In our opinion, no industrial story is more romantic than this revolution in an age-old industry. The telephone, the automobile, the radio, may be more spectacular from the public's point of view, but there is something of tremendously human significance in this invasion of the field of natural fibers by synthetics.—*Editor.*

Price Rise Proves Market Tonic

While it will be another full month before the rayon yarn price advance is fully in effect, due to the heavy advance business placed prior to the increase, the upward trend has already had a healthy effect on both the yarn market and its outlets. In the main both knitters and weavers approved of the rise as contributing toward a healthier psychology. A fair quantity of business was placed at the new levels during August, with demand slackening off noticeably toward the end of that month. A pick-up was looked for with the first spell of fall weather.

Current buying showed a marked trend to the chalkelle yarns; these were especially active in 100 denier 60 filament and 150 denier 100 filament. The price advance which was announced briefly in these columns last month, was initiated by the Viscose Co. with a rise averaging 2c. on viscose process yarns.

Evening gown of Mistvel, new chiffon-sheer velvet of duPont rayon, as featured at recent Marshall Field exhibit, Chicago, exploits the conventionalized flower motif.

Later other firms followed and by the middle of August the advance was general. There was much talk of a sympathetic rise in acetate yarn prices due to the narrowing of the differential, but no definite action had been taken. Demand for acetate was so strong at the end of August that a rise was seen as quite within possibility; however such a rise, if it came, would have little effect before November due to the heavy advance orders.

•

The New Lists

The new price list of the Viscose Co. follows:

Den.	Fil.	*Bright—Dulesco—Filenza Skeins 1st Qual.	Cones 1st Qual.
50	14	$1.07	$1.12
75	30	.87	.92
100	40	.76	.79
100	60	.78	.81
125	36	.65	.67
125	75	.70	.72
150	24–40	.57	.57
150	60	.59	.59
150	100	.62	.62
200	30	.56	.56
200	75	.59	.59
200	150	.62	.62
300	44	.48	.48
300	60	.48	.48
300	200	.51	.51
450	100	.48	.48
600	100	.48	.48
900	100	.48	.48

*Chalkelle yarns 2c more.

American Bemberg Corp.'s new price list:

Denier	Filaments	*Unconverted	†Converted
30	24	....	$1.42
40	30	$1.17	1.27
50	36	1.07	1.12
65	45	.97	1.02
75	60	.87	.92
100	75	.76	.81
120	90	.65	.70
150	112	.57	.62
180/200	135	.56	.59
240/250	183	.52	.55
300	224	.48	.51

*No twist, skeins.

†Skeins—2½ to 7 turns; Spools and Cones—no twist, 2½ to 7 turns.

15 and 25 denier also available. Matesa (dull) yarn—2c per pound extra.

Would $2 Silk Hit Rayon Prestige?

One phase of the silk price rise which has proved especially interesting to rayon merchandisers this month, is the question of whether it will impair the quality standing of rayon in relation to that of silk. Numerous silk factors in predicting eventual $2.00 silk said the animal fiber would continue up "until it was again in the luxury class." Rayon merchandisers are wondering whether, if this aim was accomplished it might not tend to widen the division between the two fibers and cause rayon to lose ground as a quality textile. While they recognize that rayon's volume is in the lower brackets, merchandisers insist that from a psychological angle, any impairment of rayon's prestige in the exclusive markets would be prejudicial; indeed it might react against demand even in the lower price fields.

It was indicated that rayon merchandisers, seeing this danger, will intensify their promotional effort to strengthen rayon's acceptance as a quality textile.

Indeed, several who were interviewed feel the matter to represent a real problem and are considering it in their immediate plans.

•

Debry Says U. S. Harasses Business

Federal interference with private business through legislation which increases the burden of cost is deplored by Paul C. Debry, president of Duplan Silk Corp., in a statement which accompanies the firm's annual report to stockholders. The report shows a net profit of $414,817 for the year ended May 31, 1935, against $659,564 in the preceding year. This is the first year since the depression the firm's profits have not shown an increase.

Mr. Debry said he was apprehensive that the tendency toward legislative influence on business "which is harassing business corporations may be accentuated in the coming years."

•

Rayon Brand Names Criticized

Spirited criticism of rayon brand names which do not indicate fiber content, was voiced Aug. 29, by Louis Rothschild, director of Better Business Bureau, Inc., Washington, in an address at the 21st annual conference of Better Business Bureaus at Syracuse, N. Y. Mr. Rothschild said that in some cases the names were so promoted as to lead the public to believe the fabrics are silk, though no such claim is actually made. He cited rayon dresses at $18.50 pointing out that customers expecting a silk dress at that price, often buy the rayon dress on that tacit assumption; he especially commented on the promotion of synthetics under brand names by firms whose names include the word "silk."

As possible solution to the problem, Mr. Rothschild proposed a three-point program: (A) National drive by National Better Business Bureaus for fab-

ric identification; (B) local educational effort by local Bureaus; (C) That Federal Trade Commission undertake test cases to establish trade practice rulings.

•

P. S. Howe Vice-President of Industrial Rayon

An executive change of significance both to the yarn and weaving divisions of the rayon industry was disclosed Aug. 20, with the announcement that Percival S. Howe, Jr., had been elected vice-president in charge of sales of the Industrial Rayon Corp. Mr. Howe has resigned as vice-president of the Suncook Mills and from the sales division of the Amoskeag Mfg. Co. Long a foremost figure in the rayon weaving industry Mr. Howe was largely instrumental in the founding of the National Rayon Weavers Association in 1933 and was president of that organization throughout the strenuous life of the NRA. He recently was elected chairman of the board of the association; as the new change takes him out of weaving and places him in the yarn industry it is understood that he plans shortly to surrender his associational office.

Mr. Howe will make his headquarters at Industrial's New York office. Louis

Percy Howe

A. Wolin and Charles R. White, who have been associated with the company in executive capacities handling sales for several years, will continue in this department of the business under the direction of Mr. Howe.

Mr. Howe entered the textile industry in 1919 and has had a varied career with Manville Jenckes Co., Wellington Sears Co.

•

Foreign Flashes

New Staple Unit in Italy—Construction of a rayon staple plant with a capacity of 2,000,000 lb. monthly, in Turin-Stura, has been decided upon by Snia Viscosa.

Japan's Rayon Rise by Deniers—The Japan Rayon Producers Association announces figures on output by denier for the first half of 1935; these show gains of about 33⅓% over the same period in 1934, in the 100 denier and lower, and in the 120 denier divisions. The 200 denier and above division has increased nearly 1,000%.

Poland's Output: Poland's rayon output during the first half of 1935 was 4,826,000 lb. against 4,350,000 lb. in the same period of 1934. Staple output fell from 394,000 lb. in 1934 to 310,000 lb. this year.

Britain's Output: Great Britain's rayon output in June was 9,950,000 lb. against the unprecedented figure of 11,100,000 lb. for May and against 7,080,000 lb. in June, 1934.

Czecho-Slovakia Gains: Production in Czecho-Slovakia in the first half of 1935 was 2,841,269 lb., slightly above 1934 when the total for the entire year was 5,678,987 lb.

French Cartel Widening—A movement to make the French Cartel 100% representative of the rayon industry is under way in Paris, the non-members being more favorably disposed because of a new liberal policy adopted by the Cartel on prices.

•

Industry Briefs

Conservative improvement is reported in the rayon fabrics market as a reaction to last month's advance in yarn prices and the strong bullish market in raw silk. Weavers say rayon fabric prices have not advanced as much as the situation would warrant, but they prefer it this way rather than have an inflationary trend which might not be sustained.

Trend to Changeable Tones—A trend toward changeable tone rayons, especially in taffetas, moires and velvets, is evident this season in the various European fashion centers, it is reported by Miss Pauline P. Alper, advertising manager, The Viscose Co., who returned recently from abroad.

Shower Curtain Fashions — Flower vines, yachts and unusual leaf effects are among the newest styles for rayon shower curtains as shown at the recent New York Housefurnishings Show, it is reported by the duPont Style Service. The newer colors are variations of wine and rust.

Industrial Nets $260,212—A net profit of $260,212 for the first half of 1935 is reported by the Industrial Rayon Corp., Cleveland, O., and Covington, Va. The company's cash on hand totalled $1,233,005.45. On June 30, $275,000 had been appropriated for plant additions.

Spun Rayon Jerseys—Spun rayon jerseys, in which the staple is combined variously with filament viscose, or with acetate or woolen or rabbit's hair yarns were shown in the New York market this month and excited much attention. Their woolly appearance yet cool quality was cited as a sales feature.

•

Rayon Mill News

Rayon Weaving Co., Fayetteville, N. C., on Aug. 2, formally transferred ownership of 69 homes, originally built by the mill company and rented to their workers, to their employees. About $25,000 is involved in the transaction. By making monthly payments through a period of 100 months, the operatives in this rayon plant will be enabled to possess their own homes.

Conneaut Winding Co., Gastonia, N. C., employing 30 workers on multiple winding of cotton and rayon yarn, has leased manufacturing space in the Centreville Mill, West Warwick, R. I.

Dixie Throwing Co., Greensboro, N. C., has let contract to Guest & Sons, Anderson, S. C., for erection of a 70x96-ft., one-story addition. The building and electrical fixtures are expected to cost about $20,000. Machinery valued at $45,000 will be installed.

Cascade Rayon Mills, Mooresville, N. C., has installed an H-W rayon yarn conditioner, purchased from Industrial Dryer Corp., and 150 new looms.

Cleveland Cloth Mill, Shelby, N. C., has increased its working force by 300 persons during the last two months following installation of a new rayon throwing department.

Abbeville (S. C.) **Cotton Mills** is changing over from the weaving of cotton sheeting to plain rayon constructions, according to an unofficial report. The plant has some 30,000 spindles and 1,000 looms.

Ladlassie Plant of **Gossett Mills,** Anderson, S. C., recently installed 108 Model XK Draper looms for weaving rayon fabrics.

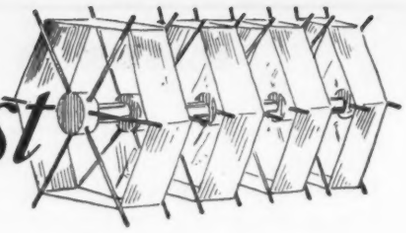
Dominion Textile Co., Ltd., has completed the transfer of rayon preparation and weaving equipment from its Verdun branch in Montreal to the Sherbrooke branch, Quebec, and 600 looms for rayon have been installed. These looms will commence operations next month producing staple and other rayons for the Canadian market.

RAYON IN THIS ISSUE

	page
New Rayon Record in U. S. and World Output	93
Technical Developments in Rayon Manufacture	94
Increasing Efficiency of Rayon Merchandising Effort	96
Rayon Pulp from Southern Pine	98
Crepes and Crepage—A Five-Part Symposium	99
Rayon Manufacturers and Weavers' Views	99
Throwing Operation Is Crucial Point	101
Warp Preparation and Weaving Important	102
Finisher's Control of Pebble and Take-Up	103
Determination of Crepage in Yarns and Fabrics	104
Promising Polo Shirt Constructions for 1936	106
Rayon Staple Must Stand on Own Merits in U. S.	107
Rayon Tests and Specifications Progress Rapidly	108
For Spring—Shantungs, Cloqués and Exotic Fabrics	109

TEXTILE WORLD'S

Silk Digest



MAE WEST may have started it, but science is carrying on the good work.

We're talking about the velvet boom.

Believe it or not, many people—including our own silk-market editor—credit Mae with initiating the renaissance of the "age of glamor," of which velvet is one of the main symbols in textiles.

But, as we said above, science will now have to be credited with at least an assist. The new crush-resistant velvets probably represent the most important single development in the history of this fabric. Ask any woman—she knows.

And while we're distributing compliments, one should go to the Velvet Guild, and to June Hamilton Rhodes, for first capitalizing on Mae's glamor—and now capitalizing on the scientist's brilliance.—*Editor.*

Silk Marches On; All Set for Parade

Plans for the second annual Silk Parade which is being held on a coast-to-coast basis during the week beginning Sept. 23, were announced by the International Silk Guild early this month to be virtually complete. Formal announcement of the coming event was made last month by Paolino Gerli, president of the Guild in a statement in which he said the Parade would carry the message of silk to more than 10 million women through the various textile manufacturing branches and the retail stores.

Distribution of copies of the official poster began in mid-August and shortly afterward the Guild started distributing its two main bodies of printed promotional material—the Guide Book, which is a voluminous folder offering sales ideas for silk promotion in all departments; and the Merchandise News, which contains accurate and up-to-date information on silk merchandise available in the market.

Early response from the stores was very enthusiastic, the Guild reported; one interesting feature this year is that stores are less disposed to limit their participation to the silk piece goods and apparel divisions; many establishments have planned store-wide events; this trend is expected to prove a big aid in making the Parade a success. All the most modern publicity paraphernalia such as fashion shows, radio, lectures, special store demonstrations, will be employed, plus various new features.

Official poster of the 1935 Silk Parade epitomizing four epochs of consumers in silk's history.

•

Rise Stirs Talk of $2.00 Silk

The modest 13c. jump in raw silk prices which we hailed so cheerily in these columns last month swelled to really significant proportions during the subsequent four weeks with an additional 20c. rise. Price developments on Crack double extra 13/15 white 78% have been as follows: June 1 it sold at $1.40; by July 26 it had risen to $1.53 and on Aug. 26 it was moving quite actively at $1.73. And the end—presumably—is not yet.

The boom in raw silk has become so pronounced that there is much speculation as to where it will lead. Importers usually conservative in their claims believe it will go considerably further up and a few—not so conservative—talk of $2.00 silk before spring. The chief reasons for the rise are: Japan's increasing consumption of her own output; her increasing exports of raw silk to countries other than the United States; the growing demand in this country for raw silk; and the recently adopted production control policy now effective in Japan.

American opinion is skeptical as to the effectiveness of the Japanese production control plan, because of the many unsuccessful efforts made in this direction in other years. However, some skeptics are changing their views now; they say that "the Japanese are in earnest" this time and that the Orientals aim to raise silk prices so high as to re-establish it as a luxury textile.

Up to date demand has been stimulated rather than impeded by the rise; however, it is questionable how much further increases the market can assimilate. Broadsilk weavers complain that the rise is pinching them as they cannot get higher prices for their quality silks; some threaten to use substitute textiles. Hosiery manufacturers obviously cannot resort to substitution and it is estimated that at least 20% of these latter mills will be compelled to buy at top prices when they need silk.

•

Deliveries Improve In "Lazy" Dog Days

Raw silk deliveries showed a decisive pick-up in mid-summer. The figures for July proved considerable of a surprise; deliveries that month totaled 44,166 bales, against 33,728 in the preceding month and the highest since the March total of 44,347. However March is normally high while July is normally a light month. In announcing its figures, the Planning and Research Bureau of the National Federation of Textiles stated that "a substantial part of the silk included in the July deliveries was shipped from American warehouses to warehouses and manufacturers in Canada."

Key figures in bales follow:

	Imports	Approx. deliveries	Stocks at warehouses end of month
June, 1935	38,984	33,728	42,018
July, 1935	34,802	44,166	32,654
Aug. 1935	46,442	41,715	37,381

The Bureau also reported at the latter part of August that the statistical position of the silk and rayon fabric industry had improved consistently for three weeks. During the week ended Aug. 17 production by stock mills was 35% above the previous week and 0.2% above the same week last year.

•

Federation's 13th Group

Formation of the Velvet Manufacturers Association of the United States, comprising firms having a velvet output of $10,000,000 annually, was announced in New York Aug. 28. The association is the thirteenth group to operate as an autonomous organization within the National Federation of Textiles, Inc. The association's officers are: Herbert H. Schell, Sidney Blumenthal & Co., Inc., president; Theodore Van Heek, Artistic Pile Fabrics, Inc., vice president; A. W. McCready, The National Federation of Textiles, Inc., secretary and treasurer.

•

Ribbon Agreement Viewed as Test

Approved by nearly 90% of the ribbon manufacturers the trade agreement by which this silk divison would retain the

more vital features of the NRA code, went into effect last month. The next step of the National Federation of Textiles, it is understood, will be to effect an agreement in the tie group, and work is under way to that end. The Federation officials are much encouraged by their success in the ribbon branch and are hopeful that the benefits accruing to this division will impress other groups. Prospects of any agreement in the broadsilk industry were viewed as very remote due to the interlocking interests of the cotton-rayon-silk weavers and their competitive problems.

•

Price Rise Aids Cheaper Fabrics

Broadsilk demand was fairly active through the first weeks of August, but slackened toward the end of the month. The let-up was ascribed partly to the usual holiday week slackening and also to the fact that buyers did not want to commit themselves further until after the showings which usually follow Labor Day. Current buying centers largely on rough surfaces and satin-backs. The rise in raw silk prices has proved more helpful to low-end lines than to the quality divisions, mill men say. Some contend that they cannot raise the prices of the high-grade silks further and that if raw silk continues to advance they will have to change to substitute textiles.

The buying during early August was mostly of the wooly-type silks, but the latter part of the month brought some preliminary interest in the lightweights. Demand for matelasses which had been sluggish in mid-August, picked up just before Labor Day and a fair amount of business was placed for September delivery.

•

Those Tardy Payrolls

Because of the tendency among certain commission throwsters to meet business difficulties by falling behind in payrolls, thus precipitating strikes and delays in deliveries, many customers are requiring throwsters to certify that mills are not in arrears to employes for labor, before placing further business. Such pledges are printed on invoices. As most throwing firms have been quick to sign the pledges, officials of the Throwsters Research Institute are confident that the objectionable practice soon will be discontinued.

Throwing activity has improved pronouncedly in recent weeks and the opening of September brought talk of an early price advance; it was indicated that the increases would be 5c. per lb. on silk and 2½c. per lb. on rayon yarns.

•

Velvet Prices Up 5c.

Velvet demand was strong in early September, and transparents advanced 5c. The new crush-resistant velvets announced early last month sold to an interested public throughout August and provoked a demand which was reflected also in the standard transparent numbers. The standard lines moved spiritedly at $1.10 and $1.20 and the crush-resistant fabrics were in good call at $1.75. The Velvet Guild predicts that velvets once limited to the luxury market now will sell in much greater volume because the crush-resistance process gives them longer wear and makes them more serviceable to the consumer than hitherto.

•

SILK IN THIS ISSUE

	page
Crepe and Crepage—A Five-Part Symposium	99
Rayon Tests and Specifications Progress Rapidly	108
For Spring—Shantungs, Cloqués and Exotic Fabrics	109
Moving Reeds	125
Heddle for Weaving Tinsel	128

Industry Briefs

Must Label Weighted Silk—The Federal Trade Commission has compelled a New York underwear fabric firm to cease using the labels "pure silk" and "100% pure silk" on merchandise which, the Commission found, contained a substantial quantity of weighting.

We Bow to F. Schumacher & Co.!—The interesting display of fabrics used aboard the liner Normandie and published in our columns last month, were from the line of F. Schumacher & Co., which firm brought them from Paris.

Skinner to Identify Fabrics—Declaring the logic of fabric identification is "inescapable," a spokesman for William Skinner & Sons announced last month that hereafter all pure silk fabrics in the Skinner and Truhu lines would be labeled "pure silk" on the selvage.

Cheney Lease Abrogated — Special Master A. S. Albrecht has authorized Cheney Bros. under section 77b of the bankruptcy laws to abrogate their lease costing $85,000 yearly at 131 Madison Ave., New York.

Contract Plan Loses—The plan to permit separate contracts covering 20/22 silk on the Commodity Exchange, New York, was defeated by the exchange's silk membership in a vote of 52 to 45. The Japanese had objected strongly, contending that the project would encourage violent price fluctuations.

R. K. Laros Silk Co., Bethlehem, Pa., commission throwsters, opened a southern office in the Johnston Building, Charlotte, N. C., on Sept. 1. Penrhyn Wilson is in charge.

•

Silk Financial Notes

C. K. Eagle & Co., Inc., advises stockholders that for the six months ended June 30, 1935, it suffered a net loss of $51,741.

Sidney Blumenthal & Co., Inc., and subsidiaries reported for the three months ended June 29, 1935, net earnings of $7,138 against a loss of $236,421 for the three-month period ended June 30, 1934.

Belding Heminway Co. reports a net profit for the first half of 1935 of $280,295 against $266,128 in the same period last year; the profit for the second quarter this year was $115,201 against $107,041 in the same period in 1934. The showing represents earnings this year of 60c. per share, on 465,032 shares of common stock outstanding against earnings of 57c. per share last year.

Silk Mill News

Lawton Mills Corp., Plainfield, Conn., has installed 100 latest type silk weaving looms to replace old equipment.

R. H. Hurworth, Inc., Putnam, Conn., employing 50 workers on pile fabrics, has leased manufacturing space in the Centreville Mill, West Warwick, R. I.

Peerless Silk Textile Co., Rockville, Conn., has discontinued its winding department and is manufacturing a new line of material. About 50 additional looms are to be installed and additional help will be employed.

M. F. Viafora Corp., Passaic, N. J., has been organized with capital of $50,000 by M. F. Viafora, Passaic, and associates, to operate a local silk mill. New company is represented by James H. Penn, 134 Summer St., Passaic.

Bond Silk Co., Inc., Paterson, N. J., has been organized under direction of Abraham Brenman, 132 Market St., Paterson, representative, with capital of 2,500 shares, to operate a local mill.

Normandy Silk Co., Inc., Paterson, N. J., recently organized with capital of 1,000 shares of stock, no par value, plans operation of local mill for manufacture of broad silks. New company is represented by Samuel Marcus, 45 Church St., Paterson, attorney.

L. Ostrow & Sons, Paterson, N. J., have acquired a mill unit at Lebanon, Pa., which will operate as the **Harlou Silk Co.**, specializing on silk linings for the coat and suit trade. The Paterson plant operates as the **Park Silk Co.**

Atlas Mills, 1441 Broadway, New York, N. Y., have concluded negotiations for mill property at Stuart, Va., formerly used for blanket manufacture, and will remodel and equip for new branch silk mill. About 100 looms and auxiliary equipment will be installed. A new subsidiary company will be formed under name of **Atlas Silk Mills of Virginia, Inc.**, to operate the plant. H. C. Lyons will be in charge at Stuart mill.

John Dunlop's Sons, Inc., Olean, N. Y., have work under way on expansion and improvements in local mill, which will be developed for the main plant of the company in the future.

Southern Silk Mills, Inc., Kernersville, N. C., has erected a one-story addition and installed a sprinkler system throughout the entire plant.

Stewart Silk Co., Easton, Pa., has resumed operations at mill, following shutdown since last June. About 175 persons will be employed in different departments on full-time production schedule.

American Silk Spinning Co., Admiral St., Providence, R. I., has filed plans for alterations to cost about $7,000.

TEXTILE WORLD'S

Knit Goods Digest

A COMPROMISE is never entirely satisfactory. It can't be. Representing, as it does, an adjustment between differing points of view, it can't please either side completely. Each is disappointed at anything less than everything.

But the compromise method is one of the most important techniques in human relationship. There are, of course, those grim, staunch souls who will "never compromise"—but the less said about them the better. The rest of us find we have to compromise, whether we like it or not.

And so, Lessing J. Rosenwald's decision in the labor dispute in full-fashioned hosiery manufacture must be judged, tolerantly, as a compromise. Either side could have developed a solution, more pleasing to it. But how about the other side?

Mr. Rosenwald not only had to reach a happy medium. He also had to decide which demands, if any, were put in for trading purposes. Under the circumstances, we think he did a good job.

—*Editor.*

Silk Rise Forces Hosiery Advance

The long-awaited increase in hosiery prices became a reality Sept. 3, when several leading manufacturers of full-fashioned hosiery announced advances of 25 to 50c. per doz. The raise was made necessary by the steady upward trend of raw silk quotations. Silk has risen nearly 50c. since spring; it did not immediately affect hosiery, as most knitters were covered far ahead. About a month ago, however, they began to buy silk and to feel the pinch of the new prices. It became increasingly evident then that hosiery prices would have to rise to meet higher raw material cost.

Hosiery was all set for a decisive price rise at the opening of September. With prices up 25c. per doz. on the low-end full-fashioned and seamless quotations in several areas 10c. above August, a general rise was anticipated.

•

Persuasion Preferred

The contractual agreement for the underwear industry which is nearing completion will have punitive provisions for enforcement but "persuasion rather than coercion" will be employed to enforce it, Roy A. Cheney, managing director of the Institute, announced Sept. 10. He also stated that the executive committee of the Institute had approved a processing-tax clause which would protect the rights of buyers.

•

Underwear Picks Up

Demand for both lightweight and winterweight underwear, which had been only fairly good through July, picked up encouragingly last month and substantial fall business was on the books as we went to press. Leading knitters reported a considerable increase in volume as against this time last year, and since prices are virtually the same, the return on investment is better. The processing tax issue has had little effect on cotton underwear commitments. Buying tone has strengthened and some firms predict prices might take an upward trend shortly.

•

Hosiery Decision Is Compromise

Prospects for peace in the full-fashioned branch of the hosiery industry were considerably strengthened Aug. 27, when Lessing J. Rosenwald, chairman of the board of Sears Roebuck & Co., handed down his decision as arbitrator of the dispute between the American Federation of Hosiery Workers representing labor and the Full-Fashioned Hosiery Manufacturers representing union mills. Mr. Rosenwald's ruling which compromised on the pivotal points, supplied the basis for completion of the new agreement to become effective Sept. 1.

On the two key issues, Mr. Rosenwald's ruling was as follows: First, he denied alike the union demand that knitters' earnings be increased 20c., and the employers' counter-demand for a 20c. cut; and second, he sustained the union's demand that the double-shift footers continue on the old NRA basis of a 36-hour week at a 40-hour pay scale, which nets these workers a bonus of 11.11%. Reaction of both sides to the decision was amicable; it was felt the arbitrator had made the best of a difficult situation, his biggest handicap being that he could not cover the non-union mills. It is pointed out further that the footer ruling will have little effect on the non-union mills especially in the South, and thus the union group will operate under a considerable handicap.

As the union's call for the 20c. increase had been largely a matter of strategy, it is felt now in many quarters that the union scored an important advantage by winning continuance of the status quo on footer rates. However, the trend of non-union mills to 40-hours, it is felt, may serve to focus union organizing effort on this group, with disturbing results.

•

Outerwear Season "Best in Years"

The bathing-suit and lightweight sweater season just closed was the most satisfactory in years. Such was the consensus of opinion among leading factors at the opening of the current month. Mills and stores alike ended the season empty of stocks, this clearance being effected without the usual price cuts. Sales managers for several large swimsuit firms said they expected retail outlets to begin buying exceptionally early next season because stores would approach 1936 summer with virtually nothing on hand. The strong volume in swimsuits and sweaters exceeded 1934 both as regards volume and profits.

The chief outerwear forecasts for next season are: bathing-suits—trunks only for men will be more active, and high styling will be dominant in women's lines; sweaters—polo shirts will tend toward better quality and higher prices.

•

Whole Trade Awaits Ringless Trial

Litigants and others directly interested in the ringless hosiery patent controversy—which means virtually the whole

The glint of metallized Cellophane adds life and style value to this knitted lace blouse designed and made by the Groblue Knitting Mills. The slit cellulose film is made by the Walser Mfg. Co. from stock manufactured by the Fabrics and Finishes Dept. of E. I. du Pont de Nemours & Co.

full-fashioned industry—plan to get busy shortly making their preparations for the trial which opens Nov. 25 in Philadelphia. Meanwhile, the definite prospect of a decision this fall has caused a pick-up in market tone on ringless lines. Many buyers are still hesitant and real confidence is not looked for until the case is finally settled, but the trade was more willing to utilize the protective guarantees and commitments were larger. The ringless litigation picture which now comprises several major and about half-a-dozen minor suits, became further complicated last month when the Dexdale Hosiery Mills filed suit in the Federal Court, New York City, seeking a declaratory judgment against Julius Kayser & Co., on charges of intimidating buyers against purchase of any but the Kaufman patent type of ringless hosiery.

•

New Elastic Fabric

Lawson Knitting Co., Pawtucket, R. I., has introduced a new elastic fabric under the trade name "Velv-O-Flex," the construction of which is covered by patent 2,009,361. The process knits in raw rubber yarn simultaneously with a cotton, wool, silk or any other knitting yarn, covering the rubber on both sides of the fabric completely. By this method, states the company, the bare rubber thread is not in any way retarded in its natural elasticity and the coverage gives the finished fabric, which is both durable and light, a smooth, velvet-like touch.

The fabric is made with a single set of needles on a circular machine. It is suitable for foundation garments of all types, abdominal supporters, bathing suits, etc. It can be made on various types of knitting machines with special patented features applied. Granite Fabrics, New York, are the sales agents.

•

Hosiery Output Falls

Hosiery business showed a seasonal decline in June and production kept in fairly close line with the decline in shipments, according to statistics made public by the National Association of Hosiery Manufacturers. Key figures by dozens announced by the association are:

	Output	Shipments	Stocks on hand end of month
May 1935 .	9,202,825	9,124,359	19,039,971
June 1935.	7,121,115	7,512,551	18,648,535

Key statistics, dozens, by Department of Commerce on hosiery follow:

	Output	Shipments	Stocks on hand end of month
May 1935 .	7,133,698	7,353,382	14,034,484
June 1935.	5,628,680	5,903,004	14,150,767
July 1935.	5,626,832	5,304,743	14,767,034

Key underwear figures other than glove silk or rayon by Department of Commerce follow:

	Output	Shipments	Stocks on hand end of month
May 1935 .	1,834,231	1,623,249	3,203,294
June 1935.	1,437,504	1,223,562	3,417,236

•

Industry Briefs

Is It Just A Rumor?—Through the devious route of a New York report from Brazil comes the rumor that a non-run knitted fabric was perfected a few months ago in Germany. It is understood that the new stitch can be used for both hosiery and heavy sweaters. No confirmation or details are available.

Elastic Top Sock Vogue Forecast—Predicting an early end for the turn-over-top sports sock, A. L. Wallou, hosiery importer, is quoted from Paris as expecting this number to be succeeded by a 10 in. sock with elastic top.

A code of fair practices which was approved by the Federal Trade Commission for the knitted outerwear industry several years ago, is being invoked by the National Knitted Outerwear Association to prevent any revival of old trade evils due to NRA nullification, it became known last month.

•

Knitting Financial

Claire Knitting Mills Co., Shelton, Conn., has reorganized under Section 77B of the Bankruptcy Act with approval of the U. S. District Court. Paid-in capital is $25,000. Abe Strassberg is president; Esther Strassberg, vice-president, and Morris Landau, treasurer and secretary.

Durham Hosiery Mills reports net loss of $64,102 for first 6 months of 1935 compared with profit of $86,593 for first 6 months of 1934.

Julius Kayser & Co. reported for the fiscal year ended June 30, 1935, net earnings of $408,085, compared with $186,423 in the previous year. It was later announced that Kayser had purchased the 35% minority interest in its Australian subsidiary for approximately $360,000, thus acquiring full ownership.

Real Silk Hosiery Mills, Inc., reported for the half-year ended June 30, 1935, a profit from operations of $110,284 as compared with a loss of $413,450 in the same period last year.

Van Raalte Co., Inc., reported for the first half of 1935, a net profit of $326,796, equalling $2.05 per share on common as against 39c. paid in 1934.

Fairview Knitting Mills, Valatie, N. Y., have been purchased by Max Weintraub.

•

Knitting Mill News

Dover (Del.) **Hosiery Mills,** recently organized by D. M. Kaplan, has purchased a quantity of full-fashioned hosiery machinery from the Norbud Hosiery Mills, Inc., Philadelphia, Pa., and will remove to plant at Dover.

Ballston-Stillwater (N. Y.) **Knitting Co.** has plans under way for construction of a large addition for production purposes.

Wiscassett Mills Co., Albemarle, N. C., is carrying out an improvement and modernization program, including the installation of 24 new knitting machines and auxiliary equipment; also building a new $60,000 dyehouse.

Long Hollar, president of **Hollar Hosiery Mills, Inc.,** Hickory, N. C., is reported as planning to construct a model hosiery mill and village between Hickory and Taylorsville, N. C.

C. & S. Hosiery Mill, Liberty, N. C., is located in the Hornady Building, specializing on 200-220-needle fancy hose.

Ridgeview Hosiery Mill, Newton, N. C., recently completed an addition to its plant and will increase output.

Martinat Hosiery Mills, Valdese, N. C., is building a 40x40-ft. addition to house a modern finishing department.

Pauline Hosiery Mills, Valdese, N. C., has bought 200 new Banner wrap-stripe machines for its plant in East Valdese.

Pilot Full-Fashion Mills, Inc., Valdese, N. C., recently purchased from Industrial Dryer Corp. an H-W conditioner for setting twist.

J. A. Cline & Son, Hildebran, N. C., have built a one-story, 165 ft. addition to house knitting and looping equipment.

Bell Knitting Mills, Inc., Lebanon, Pa., is said to be planning installation of 60 machines on rayon knit goods in the Foreman & Clark Bldg. Sanford and Sidney Kaye are owners of the business.

Argyl Silk Underwear Co., Pen Argyl, Pa., moved into its recently purchased building on Applegate Ave. The new plant has 15,000 sq.ft. floor space, and the number of employees will be increased from 600 to 100. Sol Rains is superintendent.

West Chester (Pa.) **Hosiery Mills** has installed five high-speed, 24-section, 42-gage, Lieberknecht, full-fashioned machines with 3-carrier attachments. This purchase supplements 11 machines already in place.

Margate Hosiery Mills, Inc., Chattanooga, Tenn., recently organized with capital of $100,000, have taken over former local mill of **Nick-A-Jack Hosiery Mills,** sold for $43,600 on Aug. 8 in a court action, and will occupy and put it into operation. Expansion and improvements will be made, with facilities for employment of increased working force. J. H. Wilson, president of Nick-A-Jack company, will occupy a similar position with new organization; C. A. Noone is vice-president.

May Hosiery Mills, Nashville, Tenn., have plans maturing for new one-story mill addition, 60x150 ft. New unit will be designed to house about 150 knitting machines and accessories, and is reported to cost over $60,000.

KNIT GOODS IN THIS ISSUE

	page
A Strike Without a Strike	88
Promising Polo Shirt Constructions for 1936	106
One Mill Learned Value of pH Control	117
To Apply Hosiery Transfers Efficiently	120
Washboard in 3-Carrier Hosiery	124
Loss in Weight in Bleaching Knit Goods	124
Hosiery Spotted	124
Underwear Fabric Curls	125
Circular-Hosiery Developments	128
Multiple and Single Needle Wrap Knitter	128

TEXTILE WORLD'S

Processing Digest

LAST month in this column we urged the formation of a joint committee of the technical associations of the industry to start work on the development of standards for fireproof fabrics. One of the principal reasons for the present lack of such standards is that production of fireproof fabrics has never reached any considerable volume. There are, however, many places in which non-flammable textiles could be used to advantage.

In recent years a number of companies have increased their sales by the promotion of fabrics which have been given one or another of the special finishes which impart some desirable characteristic to the goods. It is surprising, therefore, that the vast potential market for fireproof fabrics has been almost completely neglected.

It is possible, of course, to obtain fireproof fabrics, but no one is pushing them as are the producers of certain brands of waterproof fabrics, preshrunk fabrics, crease-resistant fabrics, etc. Therefore, to the finisher of cottons or rayons who is seeking to extend his activities we suggest the development and vigorous merchandising of a line of fireproof fabrics.—*Editor.*

Sulphonated Oil or Liquid Soap

It has always been somewhat of a problem to tell quickly whether certain products are sulphonated oils or liquid soaps. Apparently no simple test for distinguishing between these two types of compounds has been published. Recently our technical department suggested to a reader that he try the following procedure: "Dissolve about 6 or 8 grams of the sample in 25 c.c. of distilled water, add 50 c.c. of concentrated hydrochloric acid, heat, transfer to a separating funnel, and draw off the acid water. Neutralize this with ammonia, using methyl orange indicator, add 1 c.c. of concentrated hydrochloric acid, make up to about 400 c.c. with distilled water, bring to the boil and add barium chloride solution in the usual way. A precipitate of barium sulphate would indicate that the product was a sulphonated oil. Absence of a precipitate would indicate that the compound was a liquid soap. It may be necessary to use a little ether in order to give a clear separation in the funnel."

The inquirer now reports that he has tried this test and finds that it works satisfactorily for distinguishing between liquid soaps and straight sulphonated oils.

•

One-Bath Waterproofing and Weighting Process

A new compound, Cerol TFS, is announced by Sandoz Chemical Works, Inc., 61 Van Dam St., New York, for waterproofing textiles at any temperature up to the boil. The new compound is said to be particularly advantageous on heavy fabrics which cannot be properly impregnated at low temperatures. Furthermore, Cerol TFS is described as stable to a range of materials used for weighting or filling canvas goods and similar fabrics, such as waxes, starches, glue, gelatin, tallow, clays, talc, and can be mixed with these in any proportions. Mildew-proofing and mothproofing compounds may likewise be added. Thus the product often permits the complete wet finishing of fabrics in a single operation.

•

Palmetto Print Works Organized

Completion of plans for organization of the Palmetto Print Works, capitalized at $500,000, to be housed in the plant of the Union Bleachery, at Greenville, S. C., was made known at Greenville, Sept. 4. The firm will be owned and operated by Union Bleachery and Aspinook Co., Jewett City, Conn., and will employ about 100 when it starts operations about the first of the year. The company will work on slack suitings and rayon fabrics; four printing machines will be installed, as well as equipment for dyeing and finishing 300,000 yd. of rayon fabrics per week. J. W. Arrington is chairman of the board of the new company, which has applied for a charter in South Carolina; Philip A. Johnson is president. Other officers are: R. W. Arrington, vice-president; J. W. Arrington, Jr., treasurer; N. B. Arrington, secretary. Mr. Johnson is president of the Aspinook Co., and the other officers are connected with Union Bleachery.

Rapid Test for Silica in Peroxide Solutions

As a supplement to the standard methods now available for determining the strength and total alkalinity of peroxide bleaching solutions, chemists will welcome the new volumetric method for determining silica developed by Philadelphia Quartz Co., and announced in a recent issue of that company's publication *Silicate P's and Q's.* The procedure involves the measurement of the acid used in completing the reaction

$$6NaF + SiO_2 + 4HCl \rightarrow Na_2SiF_6 + 4NaCl + 2H_2O$$

The titration is made with 2N HCl. Calculate the exact strength of the acid by titrating against carefully prepared sodium carbonate and convert to SiO_2 equivalent as follows:

$$(\text{gms. HCl per ml.}) \left\{ \frac{60.1}{145.84} \right\} = \text{gms. } SiO_2/\text{ml.}$$

The percentage SiO_2 is then determined by the formula:

$$\frac{(\text{gms. } SiO_2 \text{ per ml.})\ (\text{mls. used})\ (100)}{\text{gms. of sample}} = \%\ SiO_2$$

The sample is transferred to a 500 ml. wide mouth Erlenmeyer flask. Methyl red is added as the indicator, 10 grams of sodium fluoride powder are added, and the flask is twirled to wet the powder. The solution of the powder will be incomplete. The sample is titrated with 2N HCl and the milliliters used in completing the reaction described above are calculated by subtracting from the observed volume the amount of acid required to neutralize the total Na_2O as determined with methyl orange indicator on a previous titration. The amount of acid required to exactly neutralize 10 grams of the sodium fluoride powder, contained in the same volume of solution as used to make the silica determination, is also subtracted.

The end-point in the silica titration fades rapidly at first and more slowly as the reaction nears completion. An operator should practice the method by determining silica on samples of known SiO_2 content until he becomes thoroughly familiar with the true end-point.

•

Sweet Potato Starch Makes Good Size

The National Bureau of Standards has found that sweet potato starch can be used satisfactorily for the sizing of warp yarns. At the mill of the Pepperill Mfg. Co., Opelika, Ala., several cuts of 13½s and 32s cotton warps were sized with this starch under mill operating conditions. These warps were then woven into cloth. The quality of this cloth was satisfactory, and no difficulties were encountered in the weaving operation. Further, broadcloth produced from the finer yarns was desized, dyed, and finished. This final product appeared equal to similarly processed cloth which had been sized with high-grade Irish potato starch.

This plant-scale work verified the conclusions deduced from experiments carried out in the semi-commercial textile mill of the Alabama Polytechnic Institute; namely, that sweet potato starch

is a decidedly promising material for use as a warp sizing agent. In conformity with the unusually high consistency of sweet potato starch sizing, it appears probable from mill scale studies that the amount of size generally employed can be materially reduced if sweet potato starch is used.

This starch is now commercially available through the efforts of the Carbohydrate Division of the Bureau of Chemistry & Soils in the Department of Agriculture. W. T. SCHREIBER

•

Textile Chemists Plan Annual Meeting

Plans are being completed rapidly for the annual meeting of the American Association of Textile Chemists & Colorists to be held in Chattanooga, Dec. 6 and 7. The program includes the annual banquet, a textile ball, a floor show, and style show. Textile manufacturers of Chattanooga and also the stores plan special displays and other features to mark the event.

•

Sulphonated Mineral Oil for Soaking Tram

A special sulphonated mineral oil has been developed by Berkeley Products Co., 114 East 32nd St., New York, for the soaking of hosiery tram silk. The company states that since sulphonated mineral oil is non-acid in nature, non-acid forming during storage, and non-oxidizable, it is specially well adapted for soaking hosiery tram, because it will not cause needles and sinkers of hosiery machines to become pitted. In addition, it is said that sulphonated mineral oil permits a direct-running silk to be produced without increasing the take-up or boil-off of the silk unduly. The oil is being manufactured by Emery Industries for Berkeley Products Co. Sulphonated mineral oil has been used for some time in crepe throwing, but only recently has been applied in soaking silk hosiery tram.

•

Industry Briefs

Water-Repelling Linen Suits — A laundering method which, it is claimed, makes men's and women's linen suits water-repellent has been developed by Carolyn Laundry, New York. The complete cost to the customer is 75c. per garment and the garment retains the water-repelling qualities until the next laundering. Gimbel Bros., the laundry states, is offering one free shower treatment by this process to all purchasers of these suits.

Advantages cited for new raincoats made by Mallard Co., New York from cloth waterproofed with Bakelite Resinoid are resistance to chemicals and hard usage, light weight, and freedom from brittleness with age.

Shrinkage Consciousness Growing in Britain—Marian Stephenson, stylist for the Sanforizing division, Cluett Peabody & Co., now in Europe reports that Great Britain is growing more interested in shrinkage possibilities, but that there is still great need for education.

Oppose Second-Run Practice—Opposition to the practice of some printers of allowing textile firms to use rollers and screens which belong to other firms is increasing among silk and rayon manufacturers. The textile division of the Fashion Originators Guild has come out against the practice and members will refuse to deal with firms participating.

Rigmel Output Rises—An increase of 2,000,000 yd. in the first half of 1935 against 1934 is the record claimed for Rigmel process operated in Britain by the Bradford Dyers Association. Rigmel is the best known of the British preshrinking methods.

Fused Collar Interests British—The Trubenizing process for fusing collars is exciting wide attention among British shirt makers, and indications are the process will be actively developed there, according to a statement in London by Ben Liebowitz, president of the Trubenizing Process Corp., New York.

•

Processing Financial

Arnold Print Works, North Adams, Mass., has filed a petition to reorganize under Section 77-B. The firm blames unrestrained price-cutting, following breakdown of NRA code in its industry, for its present difficulties. The company has been authorized to continue in charge of its affairs and the business will be operated as usual. The Arnold Sales Corp. and the Jones Purchasing Corp. are not involved in the 77-B proceedings.

Gatti Silk Dyeing Co., Paterson, N. J., has been chartered with capital of $100,000, to take over and operate local company of same name, with plant at 53-63 East Twenty-third St.

Southern Bleachery & Print Works, Inc., Taylors, S. C., organized under Delaware laws, will take over and consolidate the **Southern Bleachery, Inc.,** and **Piedmont Print Works, Inc.,** both with mills at Taylors. The merger will become effective on Jan. 1, 1936. The two plants have been under the same management.

PROCESSING IN THIS ISSUE

	page
Finisher's Control of Pebble and Take-Up	103
One Mill Learned Value of pH Control	117
Pad Dyeing Faults—Preventing Spots, Creases, etc.	118
To Apply Hosiery Transfers Efficiently	120
Loss in Weight in Bleaching Knit Goods	124
Mercerized Yarn Lacks Luster	124
Hosiery Spotted	124
Underwear Fabric Curls	125
High-Pressure Barrel-Pump	129
High-Speed Singeing Machine	129
Smooth-Surface Metallic Screens	130

Processing Plant News

Lanett Bleachery & Dye Works, Lanett, Ala., has completed a new office building and the office force has moved in.

U. S. Finishing Co., Norwich, Conn., is erecting a steel tank for butane storage and vaporizing at a cost of about $4,400.

Hosiery Processing Co., Rossville, Ga., has been organized and production is scheduled to start at early date. New company is headed by Henry T. Bryan, 3319 Long St., Chattanooga, Tenn., and H. A. Mitchell, Rossville.

Real Service Hosiery Dyeing & Finishing Co., Paterson, N. J., has been organized with capital of 2,500 shares of stock, no par value, to operate a local dyeing and finishing works. New company is headed by Samuel Kreindel, 174 Fulton Place, Paterson.

Dye-Print Service Corp., New York, N. Y., has been organized with capital of 200 shares of stock to operate a textile dyeing and printing plant. The incorporators include John Holder and Alexander Goodman. Company is represented by Levin, Rosmarin & Schwartz, 1 Madison Ave., attorneys.

Regent Print & Dye Works, Inc., New York, N. Y., has been organized with capital of 100 shares of stock, no par value, to operate a local printing and dyeing mill. George Stone, 2005 Ocean Ave., Brooklyn, N. Y., is one of the incorporators of new company which is represented by Samuel Bloom, 1 Bridge St., New York.

Penn Bleach & Dye Works has been organized at Jasper and Huntingdon Sts., Philadelphia, Pa., under the management of John J. Cabrey, Jr., 201 Windsor Ave., Narberth, Pa.

Franklin Rayon Corp., Providence, R. I., is completing construction of new three-story and basement addition, 100x160 ft., and will occupy at early date. It will represent an investment in excess of $65,000, including equipment. A. F. Smiley Construction Co., Pawtucket, R. I., is general contractor.

Rock Hill (S. C.) **Printing & Finishing Co.** have recently installed a new water purifying system.

Toronto Dyeing & Finishing Works, Toronto, Ont., are planning early rebuilding of portion of mill, recently destroyed by fire. Loss estimated at $25,000, including equipment.

TEXTILE WORLD'S

Engineering Digest

QUITE frequently an outsider who visits a weave room or a braiding room asks—when he gets back to the quiet of the office—how the noise affects the operatives. The usual answer is that "they get used to it." As a matter of fact, they don't.

In 1932, the Industrial Health Research Board, of England, conducted studies on the psychological effect of noise. A report just published, "The Performance of Weavers Under Varying Conditions of Noise," states that tolerance of excessive noise is not acquired with the passage of time and that the strain upon the operatives reduces efficiency.

There are a number of textile processes where there is bound to be a considerable racket, and because of this the tendency is to adopt a fatalistic attitude and to do nothing whatever about it. As a matter of fact, there is probably quite a bit that can be done in the way of eliminating the clatter of worn parts, systematic "tightening-up," reduction of vibration through use of insulating materials, and perhaps even some acoustical treatment of the ceiling. As the report says: "Economically it would appear to be good business to silence industrial processes as far as possible." —*Editor.*

Gas Engines Make Good Record at Amazon

In 1929 the Amazon Knitting Co., Muskegon, Mich., installed two vertical gas engines at a total cost of $55,000. By October, 1934, the saving over the former purchased power totalled $115,000.

In the period from Aug. 1, 1929, to Dec. 21, 1933, both the volume of gas used and the amount of power produced by the company's gas engines increased greatly. However, in 1933, less cubic feet of gas were required per kilowatt than in 1929. The following table is extracted from actual power cost records of the company:

	1929	1933
Cu.ft. gas used ..	6,421,200	25,172,300
Kw. produced ...	421,500	1,948,600
Cu.ft. gas per kw.	15.23	12.4

Also, over this four-year period, power costs per kilowatt were reduced from $.0087 to $.0056. This is shown by the following records:

	1929	1933
Cost of gas per kw.	$.0046	$.0044
Cost of oil per kw.	$.0007	$.0007
Cost of repairs and mech. labor per kw.	$.0034	$.0005
Total cost per kw...	$.0087	$.0056

The two multi-cylinder gas engines are of Cooper-Bessemer manufacture. One, a three-cylinder 14¾x16 in. vertical gas engine rated 220 h.p. at 300 r.p.m., drives a 150-kw. alternator. The other is a six-cylinder 14¾x16 in. vertical gas engine rated 435 h.p. at 300 r.p.m. It also drives an alternator. Both units drive exciters by means of V-belts and are paralleled with a Moore steam turbine, running at 4,560 r.p.m., this speed being reduced to 900 r.p.m., the speed of the generator.

The life of an engine of this type can be safely considered as 20 to 25 years. These gas engines have returned twice their cost in the first five years of use. Will add measurably to the profits of the company.

•

Termites Can Damage Yarn

To mention termites in connection with cotton yarn seems almost too far-fetched, and yet the presence of these tiny insects can have a very damaging effect on yarn when stored. Such an instance recently came under my observation.

A small sample of yarn was sent to us to determine the cause of cut yarn and the nature of a foreign substance deposited on the yarn at this point. The deposit, which was somewhat over an inch in diameter, appeared to be composed of fine particles of dirt, sand, and the refuse of some insect. The yarn was taken from a ball warp covered with burlap, but the burlap did not show at any point where it had been pierced.

An examination of the yarn and the deposit under the microscope indicated that some small insect had passed through the burlap and made this deposit on the yarn. After an examination of the foreign substance, and the method of making and covering the warps for shipment, the general conclusion was that a small insect was in contact with the wood roll around which the yarn was wrapped, or that the wood and burlap covering the yarn had been in contact with wood containing termites.

On checking, it was found that the yarn had been stored for a short time in a warehouse having a very badly worn wooden floor that was infested with termites. The floor was replaced and no other complaints have been made.

A mill storing yarn on wood floors should watch out for termites as they can cause considerable damage.

T.N.

•

Welding Spinning Caps

One New England woolen mill has found it worth while to set up a routine production basis for the repair of spinning caps by bronze welding. The procedure, as given in *Oxy-Acetylene Tips*, published by the Linde Air Products Co., is as follows:

The whole spinning cap is placed in a lathe on a special holder. The old head is cut off with a cutting tool, the hole is reamed out and smoothed off in order to make a small shoulder-shaped inset joint for the new head.

Small rings to fit into the machined cap are made up out of bronze welding rod. These are about the size and shape of a finger ring.

The new heads are first dipped in a solution of borax and water to moisten them, then dipped into a small heap of Brazo flux. One of the rings of bronze rod is dropped over the little protruding neck on the head and the whole assembly fitted on the previously prepared end of the spinning cap. This assembly is then placed in a special jig which was made up for this particular operation.

An oxy-acetylene blowpipe is rigidly set in position so that the flame will play over the previously prepared joint on the spinning cap. The spinning caps are placed in this jig and rotate rapidly. The flame, of course, heats the joint completely. As it reaches the right temperature, the bronze rod melts and flows over the entire surface of the joint forming a strong bond. At this point, the operator taps the part lightly with a hammer in order to be sure that the molten bronze metal has flowed thoroughly to every part.

While this heating and bronze-welding is taking place, the operator prepares and assembles the second spinning cap and places it in the opposite side of the jig. The instant the first spinning cap is completed, the jig is merely rotated 180° and this automatically brings the second cap into place ready for the operation.

A simple filing operation then smooths off the joint.

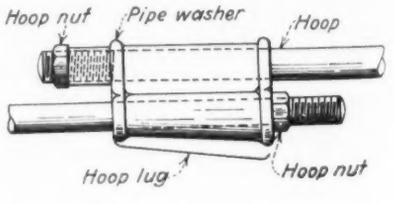
The repair job, taking into consideration all costs, is carried out for approximately 10c per cap.

•

Tightening Feed-Water Storage Tanks

Some time ago it became necessary to tighten the large feedwater storage tanks of our water-softening system, as they were beginning to leak excessively, writer J. L. Young in *Power*. These tanks are of wood-stave construction, about 40,000-gal. capacity. Each of the hoops is made in three segments, thus requiring three lugs per hoop. During fourteen years' operation, the hoop-stud nuts had been drawn several times and most of the nuts were up as far as the hoop threading would permit.

To tighten the tanks, pieces of pipe large enough to go over the hoop ends were cut 1.5 in. long. The hoop nuts



were then removed, one at a time, and one of these pipe washers slipped over the threading onto the hoop against the stud, after which the nuts were replaced and tightened. This gave the hoop nuts the stave-binding capacity necessary to stop the leaks and provided space on the hoop threads for future tightening.

•

Care of Turbine Pumps

Trouble is frequently caused in small, steam-turbine driven pumps, compressors and generators, where a flexible coupling serves to connect the turbine and the driven element, by an unbalanced thrust forcing the turbine rotor over until the wheels rub. This movement can only occur through wear of the thrust collars. An excellent check on any such wear can be had by noting weekly the width of the opening between the faces of the two halves of the flexible coupling. Record should be made of the width of this opening when the unit is new, or when it is known to be in proper adjustment. Then, if at some later date it is observed that this width is less than it was, and particularly if it is gradually lessening, it is evidence that a thrust has developed. The thrust collar is wearing, permitting the shaft with turbine wheels to move endwise. If this condition is not corrected rubbing of the wheels with consequent damage to the buckets is sure to follow.

C.J.R.

•

Costs Less to Keep Warm

In the current issue of *Factory*, Frederic Oakhill, plant engineer, Bauer & Black, division of the Kendall Co., Chicago, states: "It used to be the theory in heating the warehouse building that steam and coal were saved by lowering the temperature from the usual level of 70° during the daytime to 50° at night. But in the morning, just at the time when starting loads were throwing an extra burden on the boilers, enough steam had to be pumped into the radiators to raise the temperature of about 1,600,000 cu.ft. of air 20°. This meant the use of live steam for heating, whereas the exhaust would otherwise have sufficed.

"Now our buildings are kept at a constant temperature day and night. Theoretically, more heat is used; actually, the consumption of steam is reduced and the building is warm when the men come to work.

"A further saving in the use of steam has been made by not operating the feed water heater when the supply of exhaust steam is required for other needs, such as heating the buildings, since it is cheaper to heat the feed water in the boiler than to use live steam to do it. The make-up water has already been warmed considerably by circulating it through mill rolls, and, when mixed with the hot condensate returns, the temperature of the feed water varies from 125 to 150° F. This is hot enough to pump directly into the boiler without further heating when there is not sufficient exhaust steam available for the heater.

"Returns from the various cooling uses are segregated so that the warmer water goes into the boiler feed tank, and the cooler water is used in the bleachery for washing operations."

•

Master Mechanics At Gastonia

The Master Mechanics Division of the Southern Textile Association will meet Friday morning, Sept. 20, at Gastonia, N. C. Power and machine shop problems will be discussed.

•

Notes and New Things

Instrument Rebuilders & Repair Co., Hoboken, N. J., has started what is claimed to be a new industry. The company takes your obsolete, broken, discarded, or inaccurate instruments and rebuilds them.

Republic Steel Corp., Youngstown, Ohio, has announced a new steel of high tensile strength. One of the advantages claimed is that it makes possible reduction in weight as the gage of steel sheets can be reduced.

Harrington Paint Co., East Cleveland, has brought out Tornesit, a chlorinated rubber product that converts rust on metal surfaces into a light-proof color body resistant to acid and alkali. When using Tornesit, it is not necessary to scrape off the rust before painting; in fact it is undesirable to do so. The product also serves as a non-inflammable and tough base for paint.

•

Engineering Trade News

Moccasin Bushing Co., Chattanooga, Tenn., manufacturers of oil distributing bushings and bronze castings, has appointed Paul W. Marceau as general manager. Mr. Marceau was formerly field manager for **Johnson Bronze Co.,** New Castle, Pa.

Foster Wheeler Corp., New York, has elected Harry S. Brown as president. He succeeds his brother, J. J. Brown, who continues as chairman of the board.

A. W. Cash Co., Decatur, Ill., has appointed the **Gale Engineering Co.,** New York, as representative for the Combustion Control Division of the company.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has increased the wages of those on an hourly rate by 5%. The basic work week remains at 40 hours.

Kennedy Valve Mfg. Co. has appointed O. R. Lane as its representative in Oklahoma, Arkansas, Tennessee, eastern Missouri, and southern Illinois and Indiana. Mr. Lane will make his headquarters in St. Louis.

B. F. Goodrich Co., Akron, Ohio, and subsidiaries, reports a profit from operations of $2,902,977 for the six months ended June 30.

Root Chemical Co., Norwich, Conn., has been organized for the manufacture of chemicals for bleaching.

•

Engineering Mill News

Lanett (Ala.) **Bleachery & Dye Works** have purchased 12 houses and six vacant lots. New homes will be built.

West Point Mfg. Co., operatives of the Lanett (Ala.) and Shamut (Ala.) plants, have purchased lots located between Lanet and Shamut. Twenty-two acres of land were bought and cut up into building lots and many sold to the operatives so that they might own their own homes.

East Weymouth (Mass.) **Wool Scouring Co.,** Wharf St., has awarded contract to Thomas H. Hannaford, South Braintree, for a new dam from plans by Charles T. Main, Inc., Boston.

Firestone Cotton Mills are developing a model industrial town in the west portion of Gastonia, N. C. A crew of laborers under the supervision of J. L. Goldman, Atlanta, have been busy for a number of weeks repairing and modernizing 63 houses in the community. With new porches, roofs, flooring, plaster, paint, and plumbing, with a bathroom and other modern conveniences in every home the community will be one of the best industrial towns in the South.

Dominion Textile Co., Ltd., is making progress with erection of the new boiler house, and other buildings at its Montmorency Branch, St. Gregoire de Montmorency, Quebec.

Anchor Duck Mills, Rome, Ga., was incorrectly reported in this column last month to have let contract for brick school building; the new school which is located near the mill, is being built by the City of Rome.

ENGINEERING IN THIS ISSUE

	page
Colored Oil Places Responsibility for Oil Stains	92
True By-Product Power—What It Is	119
Checking Up on Ideas and Machines	122
Bearing Surfaces	128
Oil Resistant Belting	129
Electrical Control Devices	129
Auxiliary Relay	130
Universal Meter	130

ADVERTISING PAGES REMOVED

QUOTATIONS

At close of business, Sept, 3, 1935

Prices cover average qualities unless otherwise stated

Cotton Goods

	Sept. 3	Aug. 1	1934 Sept. 1
PRINT CLOTHS			
27 -in., 64x60, 7.60	5⅛	5	5
38½-in., 64x60, 5.35	6¼	5⅞	7⅛
39 -in., 68x72, 4.75	7⅛	6¾	8¼
39 -in., 72x76, 4.25	8⅛	8	8⅝
39 -in., 80x80, 4.00	8¾	8½	9⅛
BROWN SHEETINGS			
36-in., 56x60, 4.00	7¼	7⅛	7⅞
36-in., 48x48, 5.00	6	5⅞	6½
37-in., 48x48, 4.00	7	6⅞	7¾
MISCELLANEOUS			
Drills, 37-in., 3 yd.	9	8⅞	10
Denims, 2.20	15	14	15½
Tickings, 8 oz.	19	17½	19

Cotton Waste

Peeler comber	12.00
Peeler strip	12.25
White spooler (single)	7.00
Linters (Mill Run Average)	5.50

Cotton Prices

Spot Cotton at:	Sept. 3	Aug. 1	For Month High	For Month Low	1934 Sept. 4
New York	10.65	12.00	12.00	10.65	13.15
New Orleans	10.55	11.95	11.95	10.55	13.13
Liverpool	6.06	6.76	6.76	6.14	7.08

FLUCTUATIONS OF FUTURES

	Closed Sept. 3	For Month High	For Month Low	Closed Aug. 1	Net Change
Oct.	10.29	11.48	10.29	11.48	—1.19
Nov.	10.29	11.41	10.29	11.41	—1.12
Dec.	10.30	11.34	10.30	11.34	—1.04
Jan.	10.31	11.29	10.31	11.29	—0.98
Feb.	10.35	11.27	10.35	11.27	—0.92
Mar.	10.39	11.25	10.34	11.25	—0.86
April	10.40	11.24	10.35	11.24	—0.84
May	10.41	11.23	10.36	11.23	—0.82
June	10.41	11.21	10.36	11.21	—0.80
July	10.42	11.19	10.42	11.19	—0.77

AVERAGE PRICE SEPT.-OCT. SHIPMENT
HARD WESTERN COTTON

	F.o.b. New England Middling	St. Middling
1⅛-in.	13.04	13.79
1 1/16-in.	14.04	14.79
1¼-in.	17.29 (Nominal)	18.79

Based on Oct. 10.29.

FOREIGN COTTONS

Alexandria Exchange, Sept. 3	
November, Sak	13.68
October Uppers	11.48
Shipment c.i.f. Boston (Tariff not included)	
Medium Sak	24.25
Medium Uppers	24.50
(By Anderson, Clayton & Co.)	
India Rough, Calcutta Camilla	10.00
China Tientsin No. 1	13.00

Quotations on cotton cloth and cotton yarn as given on this page include the cotton processing tax. Cotton waste prices also include the processing tax but of course the prices on various raw cottons do not include it.

Cotton Yarn

(Tax Added)

CARDED (Average Quality)

Double Carded 2c—4c., higher according to quality

SINGLE SKEINS AND TUBES (Warp Twist)

4s to 8s	$0.26	20s	$0.29
10s	.26½	24s	.31
12s	.27	26s	.32
16s	.28	30s	.34

TWO-PLY SKEINS AND TUBES

8s-2	$0.26½	20s-2	$0.29½
10s-2	.27	24s-2	.31½
14s-2	.28	30s-2	.34½
16s-2	.28½	40s-2	.40½

SINGLE WARPS

10s	$0.27	20s	$0.29½
14s	.28	24s	
16s	.28½	30s	.34½

TWO-PLY WARPS

8s-2	$0.27	20s-2	$0.30
10s-2	.27½	24s-2	.32
14s-2	.28½	30s-2	.35
16s-2	.29	40s-2 ordin.	.41

HOSIERY CONES (Frame Spun)

8s	$0.26	18s	$0.29
10s	.26½	20s	.29½
12s	.27	22s	.30½
14s	.27½	24s	.31½
16s	.28	26s	.32½

COMBED PEELER (Average Quality)

TWO-PLY—(Knitting Twist) Cones

20s-2	$0.34½	50s-2	$0.48
30s-2	.38½	60s-2	.54
40s-2	.43	80s-2	.73

WARPS, SKEINS AND CONES

TWO-PLY—(Warp Twist)

20s-2	$0.35	50s-2	$0.49
30s-2	.39	60s-2	.55
36s-2	.42	70s-2	.65
40s-2	.44	80s-2	.75

SINGLES

14s	$0.32½	38s	$0.43
20s	.34½	40s	.44
28s	.38½	50s	.48
30s	.39	60s	.54

MERCERIZED CONES—(Combed, Ungassed)

30s-2	$0.52	60s-2	$0.70
40s-2	.57	80s-2	.96

Raw Silk

	13/15 White	20/22 White	20/22 Yellow
Special Grand, 85%	$2.04	$1.80	$1.72
Grand XX, 83%	1.97	1.75	1.70
Special Crack, 81%	1.92	1.73	1.68
Crack XX, 78%	1.87	1.72	1.67
Extra, Extra, 73%	1.85	1.70	1.65
Best Extra, 68%	1.83	1.68	1.63

RAW SILK EXCHANGE

	Sept. 3	Aug. 1	For Month High	For Month Low	Net Change
Oct.	1.70½	1.42½	1.75	1.42½	+0.28
Nov.	1.68½	1.42½	1.73	1.42½	+0.26
Dec.	1.67	1.42½	1.72	1.42½	+0.24½
Jan.	1.66½	1.43	1.70½	1.43	+0.23½
Feb.	1.67	1.43	1.70	1.43	+0.24
Mar.	1.67½	....	1.70½	1.43	.....
Apr.	1.67	....	1.70½	1.43	.....

Silk Yarns

Hosiery tram 5thd. Japan, 85%	$2.67½
Hosiery tram, 5thd. crack XX, 78%	2.47½
60/2 spun silk	2.75

RAYON WASTE

Thread (for garnetting)	$0.14½–$0.16½

Wool

OHIO, PENNSYLVANIA, ETC. (GREASE)

Fine delne	$0.31–$0.32	⅜ blood	$0.32–$0.33
Fine clthg	.23– .25	¼ blood	.30½ .31½
½ blood	.30– .31		

TEXAS AND CALIFORNIA (CLEAN)

Texas, 12 months	$0.73–$0.75
California, Northern	.63 .65

MONTANA, IDAHO, WYOMING (CLEAN)

Staple fine	$0.75–$0.77
Staple ½ bld	.71– .72
Fine and fine medium (original bag)	.67– .69
⅜ blood	.62– .65
¼ blood	.58– .60

EASTERN SCOURED PULLINGS

A.A	$0.75–$0.78	B-Super	$0.65–$0.72
A-Super	.71– .73	C-Super	.60– .62

CARPET WOOL (Nominal)

Aleppo (clean)	$0.24–$0.28
Sining	.13– .14
China filling (clean)	.09– .14

Tops and Noils

TOPS—BOSTON

Fine (64-66s)	$0.93–$0.95
Half-blood (60-62s)	.89– .90
Aver. ¾ blood (56s)	.78– .80
½ blood (50s)	.68– .72

NEW YORK TOP FUTURES

	Closed Sept. 3	For Month High	For Month Low	Closed Aug. 1
Oct.	86.0	86.0	82.9	82.9
Nov.	86.0	86.0	82.9	82.9
Dec.	86.8	86.8	83.0	83.0
Jan.	86.5	86.5	83.1	.....
Feb.	86.5	86.5	83.2	.....

TOPS—BRADFORD ENG. Sept. 2

Fine (64s) 32d	¾ bld. (56s) 20½d
½ bld. (60s) 29½d	¼ bld. (50s) 15½d

NOILS—BOSTON

Fine	$0.56–$0.58	¾ bld.	$0.48–$0.50
Half bld.	.53– .55	¼ bld.	.42– .45

Worsted Yarns

ENGLISH SYSTEM WEAVING

2-20s 44s	$1.00 –$1.05	2-36s 58s	$1.35 –$1.40
2-30s 46s	1.05 – 1.10	2-40s 60s	1.40 – 1.45
2-30s mixes	1.40 – 1.45	2-50s 64s	1.52½– 1.55

ENGLISH SYSTEM KNITTING

2-20s 44s	$0.90 –$0.95	2-20s 60s	$1.15 –$1.20
2-20s 50s	0.95 – 1.00	2-20s 64s	1.25 – 1.30

FRENCH SYSTEM

1-26s 64s	$1.15 –$1.20	2-40s 64s Zephyrs	$1.47½–$1.50
1-30s 64s warp	1.32½– 1.35	2-50s 66s	1.65 – 1.70

Domestic Rayon (Skeins)

VISCOSE PROCESS

Denier	Filament	Price	Denier	Filament	Price
50	14	$1.07	150	24–40	$0.57
75	30	.87	150	60	.59
100	40	.76	300	44	.48
125	36	.65			

ACETATE PROCESS

Denier	Price	Denier	Price
45	$1.10	100	$0.77½
55–65	1.05	120–125	.68– .73
75	.90	150	.60

CUPRAMMONIUM PROCESS (TWISTED)

Denier	Filament	Price	Denier	Filament	Price
30	24	$1.42	100	75	$0.81
75	60	.92	150	112	.62